PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

FEB 1 6 1933

FEBRUARY 1933

Journal of Educational Research

Registered June 4 1929

CONTENTS

		PAGE
Summary of Reading Investigations (July 1, 1931 to June 30, 1932)	*William S. Gray*	401
Relative Difficulty of Junior High School Social Studies Texts	*John Francis Cramer*	425
The Growth and Nature of Research Interest in Arithmetic and Reading	*William A. Brownell*	429
Problems in the Training of Research Workers	*Helen M. Walker*	442
Equalization of the Burden of Capital Outlay in a State's Minimum Educational Program	*F. E. Grossnickle*	449
Editorials		457
Reviews		458
Research Abstracts and Bibliographies		465
Research News and Communications		472

THE JOURNAL OF EDUCATIONAL RESEARCH is indexed in the Education Index

---

Copyright 1933, by Public School Publishing Co.

Entered as second-class matter at the Post Office at Bloomington, Illinois, under the act of March 3, 1879

JOURNAL OF EDUCATIONAL RESEARCH

EDITORIAL BOARD

A. S. BARR, *Chairman, Professor of Education, University of Wisconsin, Madison, Wisconsin*

E. J. ASHBAUGH, *Dean, College of Education, Miami University, Oxford, Ohio*

HARRY J. BAKER, *Director, Psychological Clinic, Detroit Public Schools, Detroit, Michigan*

LEO J. BRUECKNER, *Professor of Education, University of Minnesota, Minneapolis, Minnesota*

CARTER V. GOOD, *Professor of Education, University of Cincinnati, Cincinnati, Ohio*

ERNEST HORN, *Director, University Elementary School and Professor of Education, State University of Iowa, Iowa City, Iowa*

CHARLES W. KNUDSEN, *Professor of Education, George Peabody College, Nashville, Tennessee*

CLIFFORD WOODY, *Director, Bureau of Educational Reference and Research and Professor of Education, University of Michigan, Ann Arbor, Michigan*

ASSOCIATE EDITORS

FRED C. AYER, *Professor of Educational Administration, University of Texas, Austin, Texas.*

FOWLER D. BROOKS, *Head of Departments of Education and Psychology, DePauw University, Greencastle, Indiana.*

WILLIAM A. BROWNELL, *Professor of Educational Psychology, Duke University, Durham, North Carolina*

B. R. BUCKINGHAM, *Lecturer in Education, Harvard University, Cambridge, Massachusetts*

W. W. CHARTERS, *Director, Bureau of Educational Research and Professor of Education, Ohio State University, Columbus, Ohio*

VIRGIL E. DICKSON, *Assistant Superintendent of Schools and Director of Bureau of Research and Guidance, Berkeley Public Schools, Berkeley, California*

EDGAR A. DOLL, *Director, Department of Research, Training School, Vineland, New Jersey*

WILLIAM S. GRAY, *Director, Teacher Training, University of Chicago, Chicago, Illinois*

CHARLES E. GREENE, *Director of Research, Denver Public Schools, Denver, Colorado*

M. E. HAGGERTY, *Dean, College of Education and Professor of Education, University of Minnesota, Minneapolis, Minnesota*

V. A. C. HENMON, *Chairman, Department of Psychology and Professor of Psychology, University of Wisconsin, Madison, Wisconsin*

KARL J. HOLZINGER, *Professor of Education, University of Chicago, Chicago, Illinois*

EARL HUDELSON, *Dean, College of Education and Professor of Education, West Virginia University, Morgantown, West Virginia*

FREDERICK J. KELLY, *Chief, Section of Colleges and Professional Schools, Office of Education, Department of the Interior, Washington, D. C.*

WILLIAM A. McCALL, *Professor of Education, Teachers College, Columbia University, New York City*

W. J. OSBURN, *Director of Research, State Department of Education, and Professor of School Administration, Ohio State University, Columbus, Ohio*

SHELTON PHELPS, *Dean, Graduate School, George Peabody College, Nashville, Tennessee*

DOUGLAS E. SCATES, *Director, Research and Statistics, Cincinnati, Public Schools, Cincinnati, Ohio*

JESSE B. SEARS, *Professor of Education, Stanford University, California*

FRANCIS T. SPAULDING, *Associate Professor of Education, Harvard University, Cambridge, Massachusetts*

JOHN L. STENQUIST, *Director, Bureau of Educational Research, Department of Education and Lecturer, Johns Hopkins University, Baltimore, Maryland*

PERCIVAL M. SYMONDS, *Associate Professor of Education, Teachers College, Columbia University, New York City*

W. W. THEISEN, *Assistant Superintendent of Schools, Milwaukee, Wisconsin*

M. R. TRABUE, *Executive Secretary of the Committee on Individual Diagnosis and Training, Institute for Employment Stabilization Research, University of Minnesota, Minneapolis, Minnesota*

W. L. UHL, *Dean, School of Education, and Professor of Education, University of Washington, Seattle, Washington*

CARLETON W. WASHBURNE, *Superintendent of Schools, Winnetka Public Schools, Winnetka, Illinois*

GUY M. WHIPPLE, *Secretary, National Society for the Study of Education, Danvers, Massachusetts*

ELIZABETH L. WOODS, *Supervisor, Educational Research and Guidance, Los Angeles City Schools, Los Angeles, California*

G. A. YOAKAM, *Professor of Education and Director, Courses in Elementary Education, University of Pittsburgh, Pittsburgh, Pennsylvania*

THE JOURNAL OF EDUCATIONAL RESEARCH is published at Bloomington, Illinois, monthly, except June, July, and August by the Public School Publishing Company. The subscription price is $3.50; $3.50 in Canada or Mexico; and $3.80 in other foreign countries.

Subscriptions and all communications about reprints or other business matters should be addressed to the PUBLIC SCHOOL PUBLISHING COMPANY, at Bloomington, Illinois.

Address all communications on editorial matters to A. S. Barr, Department of Education University of Wisconsin, Madison, Wisconsin.

JOURNAL *of* EDUCATIONAL RESEARCH

Volume XXVI FEBRUARY, 1933 Number 6

SUMMARY OF READING INVESTIGATIONS
(July 1, 1931 to June 30, 1932)

WILLIAM S. GRAY
University of Chicago

THIS article presents a summary of the major studies relating to reading published between July 1, 1931, and June 30, 1932. It continues the series which has appeared annually since 1925 in the *Elementary School Journal*. The discussion that follows aims merely to acquaint the reader with the various phases of reading studied during the year and the most significant findings. A study of the content of this article should be supplemented by a critical reading of the various studies in which each reader finds himself most interested.

Reading readiness.—The importance of adequate preparation for reading is emphasized with increasing vigor from year to year. In a study of maladjusted pupils, Raybold (85) found that mental immaturity, "not necessarily low intelligence quotients," was the chief cause of non-promotion in the 1B grade. Practically all who entered the grade with a mental age of 76 months were promoted. The wisdom of teaching reading to those of lower mental age is being studied further.

Merits of different methods of beginning reading.—Bergman and Vreeland (2) compared the progress of first-grade pupils taught through the use of the *Picture-Story Reading Lessons* and a Visual Method, so called from its wide use of stereographs and the stereopticon. The two methods which aim at widely different results are alike in that each endeavors to develop a well-selected vocabulary by the end of the first semester. The tests of word recognition which were given showed that the Picture-Story Method was the more effective. The writers pointed out clearly that other measures of efficiency are essential before final conclusions can be drawn. Gatto (37) reported a study carried on in Pittsburgh to determine the relative effectiveness of two reading systems in the 1B grade which were ranked about equally high by the textbook committee. Unfortunately the names of the systems used are not given.

It is significant that the teachers' reactions and the test results agreed very closely.

Printing, cursive writing, and manuscript writing in beginning reading.—Two studies were reported which were concerned with the kind of writing that proved most effective in teaching beginning reading. Long and Mayer (62) compared the progress of two groups of five hundred children each, taught to read through the use of print and cursive writing respectively. The latter method proved definitely less effective than the former in preparing pupils to read print. No study was made of the effect of the use of the two methods on reading script and in learning to write. Voorhis (108) compared the relative merits of cursive and manuscript writing when used in first-grade classes. All the evidence secured indicated the superiority of the latter, both for use in teaching reading and as a form of writing for primary pupils. Final decision as to the adoption of manuscript writing should be postponed until studies are completed which show whether the transition can be made later to cursive writing without great loss. As far as reading is concerned, the use of either print or manuscript appears to be better than cursive writing.

Value of phonetics.—The value of phonetics always arouses interest. Garrison and Heard (36) report a study in which the progress of two groups of children was studied from the first to the third grade. One group received no direct training in phonetics; the other was taught according to the methods elaborated in *The Teaching of Phonetics* by Daugherty. Both groups were tested extensively in reading and spelling. The data secured showed that the pupils in the phonetic group were more independent in word pronunciation and were better spellers. The non-phonetic group read aloud more smoothly and better and lost less in reading during the vacation following grade I. The writers concluded that much of the phonetic training now given in the first grade could be postponed until the second and third grades and that additional means should be used to teach word discrimination in the first grade. These findings support the conclusion that phonetic training has value but that the elaborate emphasis on it which prevailed earlier is ineffective.

The selection of primers.—A unique procedure in selecting a primer for use in a non-English speaking community was reported by Donovan (27). Pupils from English-speaking and non-English groups were tested on the important or key words of eight selected primers. As a result of several such tests, the primer offering the fewest vocabulary difficulties

for non-English speaking children was selected. A second study by Harring (47) was concerned with the selection of the most appropriate primers to use in supplementing a basal text. As an essential step in securing needed information, an analysis was made of fifteen primers to determine the number of different words, the total word count, the average amount of repetition and the average number of new words per page. A table was then prepared showing the order in which the various books supplemented the vocabulary in each book of the series. The use of the books in the order indicated was recommended on the assumption that the vocabulary should increase gradually in the successive primers used.

Classification and segregation of pupils for instruction in reading.—Various conclusions were reached in studies which employed one or another form of classification or segregation. Bonar (5) classified first-grade pupils into ability groups and compared their progress with that of mixed groups. His finding resulted in the recommendation that mixed classes be retained in grade IB and that teachers adapt instruction to the needs of pupils within classes. McElwee (71), on the other hand, found that homogeneous grouping and special instruction adapted to the needs of each group was superior in grades I to IV inclusive to grouping in mixed classes. Horrall (51) classified fifth and sixth grade pupils on the basis of reading test scores and compared their progress with that of heterogeneous groups. He concluded that this type of classification secured better results provided teachers adapted their teaching to the achievement and needs of the group taught. Clark (16) used chronological ages and intelligence quotients in assigning pupils to grades and test scores in classifying pupils for purposes of instruction in each grade. The progress made was distinctly superior to "the previous plan" used which was not described in the article. Gray and Hollingworth (40) compared the progress of gifted children enrolled in special opportunity classes with those not in mixed classes. The progress made by pupils in both types of classes led to the conclusion that gifted children make better progress than those of lesser ability whether segregated or in heterogeneous groups. The chief advantages of homogeneous groups of gifted children "lie not so much in expectation of greater achievement in the tool subjects as in an enrichment of scholastic experience with additional intellectual opportunities" (40:261). The foregoing reports indicate that further investigation is essential before the advantages and limitations of different types of classification are fully understood. It

appears, however, that grouping on the basis of achievement is valuable in adapting instruction in tool subjects to the needs of pupils and that grouping on the basis of ability provides greater opportunity for enrichment and intellectual growth.

Overlapping in content of readers.—Several years ago, studies of the content of readers revealed a surprising amount of overlapping. In order to determine recent trends in this connection, Cooper (17) studied the content of sixteen sets of recently published readers and compared her findings with those of previous studies. The results show distinct progress during recent years in the elimination of duplicating selections.

Correlation between reading ability and such items as intelligence and class marks.—In a study including 122 senior high-school pupils, Garrison and Bivens (34) secured scores on the Thorndike Test of Word Knowledge, the Thorndike-McCall Reading Scale, and the Miller Mental Test. The correlation between intelligence and vocabulary was .62 ± .04, and between intelligence and reading, .40 ± .06. These findings compare favorably with the results of previous studies. Brown and Lind (8) compared the reading achievement of pupils of the same mental age but differing in intelligence quotients. The investigators concluded that "the relation of achievement to mental age depends not so much upon the level of intelligence but upon the position of that level in the group receiving instruction" (8:574).

Brooks (6) made an elaborate study of the correlation between reading achievement and class marks at the junior high-school level. The correlation between the scores on the Thorndike-McCall Reading Test and (a) class marks in the seventh grade was .511, and (b) combined marks in the seventh grade and Stanford Achievement Test scores was .617. The corresponding correlations for the Holly Sentence Vocabulary Test was .462 and .579 respectively. These correlations are relatively high and emphasize the importance in scholastic pursuits of ability to comprehend what is read and a large meaning vocabulary.

Achievement in reading.—Various studies were reported which aimed to determine the achievement of specific groups of pupils. For example, Root (90) analyzed the results of a first-grade reading survey of California. The tests used were the Lee-Clark Reading Tests, Primer and First Reader. The usual wide range in achievement was reported. An analysis of the scores showed that there was no significant difference in the achievement of rural and city schools. This differs from the findings of most previous studies. The schools reporting a great deal of activity

work ranked distinctly low in silent reading achievement. On the other hand, those schools which reported the wide use of supplementary seatwork tests did better than those not using them.

McAnulty (67) compared the achievement and intelligence test scores of Japanese and American children in grades I-VI in Los Angeles. The findings showed that the former compare favorably with the latter both in mental ability and in achievement in reading but are slightly retarded in chronological age. Jones (57) compared the comprehension scores in oral reading and silent reading of pupils in grades III, V and VII from five types of schools. The majority of the 300 pupils tested made about the same comprehension scores in oral as in silent reading. There were wide individual variations, however, these results differ somewhat from those of previous studies.

Tests given by Stockrahm (100) to freshmen in Indiana University revealed wide variations and serious deficiencies in reading achievement. The difference in achievement between sexes was not significant, the men reading slightly faster and the women somewhat more accurately.

Improving achievement in reading.—One of the encouraging facts revealed by the literature for the year is that teachers and investigators are keenly interested in discovering methods that will increase the reading efficiency of their pupils. Lowry (64) organized time-pressure drills in all subjects requiring reading in grades IV to VIII inclusive. As a result of ten weeks of intensive work, the pupils gained a year or more on practically all of the tests used. McCarty (69) organized experimental and control groups among ninth and tenth grade pupils. The experimental group met one hour daily for special training in reading; the control group received no such guidance. After twelve weeks of training, the investigator concluded that special training in reading "gave a greater, though not statistically significant, increase in comprehension" than was secured from regular class work. The improvement was about equal for pupils of low and average intelligence.

Two studies were concerned with improvement in work-type reading. Jacobs and Liveright (52) gave intensive training in study-type reading to pupils in grades IV, V, and VI for a period of seventeen weeks. Various methods of training were used in promoting ability to answer questions, follow directions, discover central ideas, decide upon the total meaning, organize thought in various forms, and read rapidly. A comparison of control and experimental groups showed "the undoubted value of definite attention to the teaching of study-type reading." Sibley (95)

also secured very marked improvement in work-type reading by diagnosing the pupils' difficulties, grouping them according to their needs, and providing appropriate training.

Hilliard (49) compared the value of extensive library reading and of specific drill in improving silent-reading achievement in the fifth grade. After eight weeks of training, both the extensive library and the drill groups had made greater average gains than the control groups which followed their usual procedure in reading classes. An analysis of the test scores showed that wide reading and drill promoted growth on different parts of the test used. This harmonizes with previous findings. Use should be made of either or both types of training according to the needs of pupils. Hermans (48) compared the value of free and directed reading on six junior high-school groups during a semester. The free-reading group made a greater gain on the Sangren-Woody Test; both groups made the same amount of improvement on the Stanford Test. For two groups, the free reading proved much more productive; for the remaining groups, one method counterbalanced the other. These variations in the results might be explained in terms of differences in the needs of the pupils or in preferences of teachers for one method rather than another.

Two studies were concerned with the improvement of reading at the college level. Berry (3) carried on a study with the following question in mind: "Taking the freshman with his present intelligence and background, with his visual acuity and perceptual habits of reading as we find him, can we improve him in the rather technical matter of his use of specific reading processes or performances?" (3:826). Nine specific reading abilities were chosen for experimentation. The results of training given to 204 students showed clearly its value, the greater gains being made by the students of superior intelligence. In a study carried on in the University of Buffalo, McGrath (72) found distinct improvement in both rate and accuracy of reading resulting from training in study techniques introduced into a general course in psychology. In an elaborate study by Eurich (30), it was found that specific training in vocabulary resulted in measurable improvement. Practice exercises in comprehension which had no relation to other reading activities in which the students were engaged failed to secure any increase in general reading achievement.

It is evident from the foregoing summaries that definite improvement in reading ability can be secured in most groups through the use of appropriate training and guidance. The chief problem which any teacher

faces in this connection is to define the needs of the pupils and to select appropriate teaching material and techniques. Teachers will find Sangren's (91) report on the improvement of reading through the use of tests of great value in attacking such problems.

Reading in the content subjects.—Reading problems in the content subjects receive increasing attention from year to year. McCallister (68) reported the results of observations and of analyses of the materials and techniques of teaching history, mathematics and general science at the junior high-school level to determine the types of reading required. The results showed clearly "that pupils must make adjustments to numerous and varied types of reading activities. The character of these activities differs greatly in different subjects and in different classes, depending on the techniques employed by teachers and the kinds of instructional materials assigned" (68:123).

Four studies relating to reading in arithmetic were reported. Low (63) carried on a study in England to determine if ability to solve problems is correlated with ability to comprehend what is read. The correlation was not high enough to be significant. Stevens (99) found that achievement in problem reading is more closely correlated with achievement in problem solving than is achievement in general reading or in fundamental operations. These findings emphasize the importance of training in the kind of reading and thinking essential in the interpretation of problems. This is one of the fundamental obligations of the teacher of mathematics. Monroe and Engelhart (78) reach similar conclusions as a result of experiments and the study of scientific literature relating to the reading of arithmetic subject matter.

The importance of training in reading in specific subjects was further emphasized by the findings of Jacobson (53) in an experiment to improve the achievement of ninth-grade pupils in reading in the field of general science. The reading exercises used were concentrated on three major skills involved in work-type reading, namely, comprehension, organization, and location of material. The comparison of the progress of the experimental and control groups led to the following conclusions: "(1) Reading lessons given in general science produce superior knowledge of general science to an extent which cannot be explained by chance. (2) Reading lessons given in general science have a beneficial effect on the general scholastic achievement of ninth-grade pupils. (3) Reading lessons of the type used in this experiment are more beneficial to poor initial readers than to good initial readers" (53:281). It may be inferred

from the last conclusion that the training given related to the more rudimentary phases of reading in which the good readers were already reasonably proficient. Had types of interpretation been emphasized which characterize the superior student of science, the results would doubtless have been somewhat different.

Lyman (66) summarized studies relating to reading and literature at the secondary school level. He concluded that "the narrow curriculum to which earlier generations have been subjected, consisting in the intensive study of a few literary masterpieces, is being widely supplemented . . . by extensive reading of a natural sort" (66:56). This change is accompanied by the introduction of numerous reading problems which teachers of literature are just beginning to recognize.

Waples (109) pointed out the common relation of reading problems to librarians and those interested in the social sciences and outlined significant problems for coöperative research.

Vocabulary problems.—Three types of vocabulary studies were reported. The first was concerned with measures of the vocabulary of printed materials. Patty and Painter (81) discussed a new measure of the vocabulary of textbooks, based on the frequency of words in a sample, a weighted value of each word, and the number of words in a sample. The word-weighted-value is the product of the Thorndike index number and the frequency of the word in the passage. The average-word-weighted-value is the quotient obtained by dividing the total weighted values by the total number of words in the sample. The index of difficulty is obtained by dividing the average-word-weighted-value by the number of different words in the sample. This gives the ratio of the different words to the difficulty of the average word. No attempt is made in the article to establish the validity of the measure. Lewerenz (61) reported the grade placement of 250 books with respect to vocabulary difficulty and vocabulary diversity through the use of the Lewerenz Vocabulary Grade Placement Formula described in the March, 1929, number of the *Los Angeles Educational Research Bulletin*. One of the impressive facts revealed is the wide range in the vocabulary difficulty of books used at given grade levels.

Two studies were concerned with the meaning vocabularies that had been acquired by pupils. Pressey and Moore (83) gave vocabulary tests, covering 106 technical words in arithmetic, 49 in algebra, and 88 in geometry, to determine growth in mathematical vocabulary from the third grade through high school. The results showed that certain terms,

such as "minus," are learned early and remembered. Other terms, like "altitude," are learned slowly but steadily. One of the striking facts emphasized by the test papers was the inadequate mastery of the fundamental vocabulary of the field. Johnston (56) presents the results of a preliminary study among high-school pupils to determine the relative sizes of their meaning vocabulary when words are encountered in context and of their definitional-recognition vocabulary. The device used was to compare the number of words not known in text with the number whose meanings were identified in a five-word-choice vocabulary test. The data secured indicated that the reading vocabulary is about 11 percent greater than the definition vocabulary. This finding can be accepted only tentatively owing to the nature of the tests used.

The results of various vocabulary counts were reported. Kraus and Harap (59) studied the frequency of musical terms in over seven million running words in newspapers and magazines. A total of 352 musical terms were found, of which 31 percent appear in Thorndike's list of ten thousand words. Brown (7) presented the results of a comparison of the vocabularies of five histories and five readers for the sixth grade with respect to the number of new words, length of words, and rating on the Thorndike list. The data showed that the histories were much more difficult than the readers, which led to three alternative recommendations: rewriting textbooks, assigning them to later grades, or deliberate drills on word meanings. Kelty (58) presented a basic vocabulary in American history, following an analysis of units of subject matter that should be taught, and compares it with nine other published lists of words. Chaudhury (14) reported the frequency of words in passages in Bengali containing 100,000 running words and applied the findings in a critical study of primers and in developing a primer. Dale (24) compared the words of the International Kindergarten list and of the most frequent thousand of the Thorndike word list. The number of common words is 769 which are reasonably well known to children and have permanent value to them in their reading vocabularies.

Only two studies were concerned with methods and values of developing meaning vocabularies. Haefner (46) reported distinct value of casual contacts with words in learning their meanings. The specific device used was to write a new word with its definition and an illustrative sentence on the blackboard each day before the experimental class came into the room. As soon as the class work began, the definition and its illustration were erased. Eurich (30) found that special vocabulary

drills given to 196 freshmen students proved valuable. The results of both of these studies suggest the value of greater attention to vocabulary building at all levels.

Interest in reading.—Various studies were reported of the reading interests and habits of both children and adults. Johnson made studies of the reading interests of children (55) and of adults (54) in Duluth. The data showed that children read much more often than adults and that much larger percentages of them read books and magazines. Both children and adults read the newspaper for about thirty-five minutes daily. One of the striking conclusions was the need for greater attention to the cultivation of appropriate newspaper and magazine habits; another was the need for better juvenile magazines. A study of the reading of gifted children by Witty and Lehman (115) showed that the readings reported were decidedly superior in type to those of unselected children. In view of this fact, the investigators concluded that much needed enrichment in the curriculum of the bright child may safely come through wide independent reading. A study by Cain and Brown (11) of the reading interests of senior high-school pupils showed that more than half of the books read had some literary merit. The percentage of harmful books was very small. Those having no special merit were mystery, detective, murder and light love stories. There is obvious need for the cultivation of discrimination and improved tastes in much of the voluntary reading among high-school seniors.

In a quantitative study of the voluntary reading of freshman students in a teachers college, Cuff and Donovan (21) found that more than 80 percent read magazines and newspapers regularly. The average number of books read during a semester was 4.3. This is somewhat higher than the average reported in an earlier study by Baird for an academic year. About twelve hours a week were used on the average for voluntary reading. The wide variation in the amount of time devoted to reading is striking and significant. The reading interests of 503 adult women, as determined by Witty (114) present a less encouraging picture than the studies reported above. "The conspicuously small amount of reading and its standardization are distressing signs" (114:562). Waples (110) points out that the relation between what adults say they want to read and what they actually read is not very close. This may be due in part to the inaccessibility of much of the material wanted and to the reading difficulty of a large part of that which is accessible. It is very encouraging that an extensive survey has recently been made by Cheney (15) of

readers, or book buyers. The motive for the study was largely economic. Nevertheless, the report presents a body of data of great significance to all those interested in adult reading habits.

Books for children.—In an effort to develop a book-list which reflects the favorable judgments expressed in most previous investigations, Garrison and Hackworth (35) made a comparative study of ten book lists. The result of their work was a list of ten books per grade, for grades I to VIII inclusive, recommended in as many as four of the ten lists. On account of the wide variation in the titles recommended in each of the ten lists and in the grade placement of many that were included, Garrison and Hackworth recommended continued research in this field. An example of the difference in book lists is presented by Shuttleworth (93) who compared the *Winnetka Graded Book List* and *A Guide to Literature for Character Training* with respect to grade placement and the relative worth and interest value of books. Whereas the relative grading is close in the two lists, the average grade and range of grades are in disagreement. For example, books placed in grades I, II, and III in the Guide are often located in grades IV and V on the Winnetka list; books placed in grades VIII, IX and X in the former are often placed in grades VII and VIII in the latter. On the other hand, there is very close agreement in the estimates of the merit of the books in the two lists. Additional knowledge concerning the factors which make a book attractive to children was secured by Mellinger (75) and by Martin (74) in their studies of children's interests in pictures and their preferences for book illustration.

Diagnostic and remedial training in reading.—Almost a sixth of the studies reported during the year related to diagnostic and remedial training. Space will permit only a brief survey of this literature. The most valuable contribution was the report by Monroe (77) of the methods employed in the diagnosis and remedial treatment of 415 children with special reading defects. The methods used and the discussions of the various causes of reading deficiency should prove very helpful to all concerned with diagnosis and remedial training.

The characteristics of poor readers were studied specifically by several investigators. For example, Eames (28) found that in reading disability cases the eyes are more exorphic at the reading distance, that is, the visual lines deviate outward from parallelism when the eyes are at rest, which carries over when the eyes are in use, resulting in imperfect convergence, fixation, etc. Hypermetropia is also more common than among unselected

cases. Studies by Birdsall (4) and by Anderson and Kelley (1) were concerned with the mental habits and with various general traits of reading disability cases.

Detailed reports of individual cases proved very illuminating. Nelson (80) reported the case of a nineteen-year old boy with a reading disability due to an eye injury at birth. During the early school years, no one detected the persistence of this difficulty. As a result, the boy encountered serious difficulty and finally became greatly retarded. Richards (88) reports the case of a boy of superior intelligence but deficient in reading and spelling. The difficulty was attributed to "deficient visual imagery." The reports of such cases as those just cited emphasize the importance of a very careful diagnosis of the needs of all pupils who begin to show evidence of genuine difficulty in reading.

The value of special training for deficient readers is clearly shown in several studies. Woods (117) describes the provision made in Los Angeles for non-readers. By a non-reader is meant a child of normal intelligence, or above, who encounters serious difficulty in learning to read. The remedial training provided is characterized by the wide use of the so-called kinaesthetic method, in which word recognition is promoted largely through writing the new words encountered. Reports by Moore (79) and by Wegelin (112 and 113) describe the very valuable experimental teaching which has been carried on in Pittsburgh to help poor readers in both the grades and the high school. The striking fact emphasized by these studies is that wherever teachers make detailed studies of the reading needs of pupils in either the grades or high school and provide appropriate training, gratifying improvement in achievement results. Studies by Sibert (94) and by Slemons (97) among high-school pupils supply additional evidence of the value of specific attention to the needs of poor readers.

Even at the college level remedial training has proved very effective. For example, Robinson (89) presented evidence which showed clearly the value of clinical treatment of college students ranking in the lowest tenth of the freshman group with respect to reading achievement. As a result of the help given, there was marked improvement in reading achievement and scholastic progress. The amount of improvement correlated closely with the intelligence of the student and with his willingness to coöperate. In a study reported by Thompson (102), equally significant results were secured among freshmen in a teachers college who ranked below the tenth-grade norm in reading achievement. These students met once a week for

eight weeks for special help and guidance. Pressey's *Manual of Reading Exercises for Freshmen* provided part of the practice recommended between group meetings. It is hoped that the need for remedial training in reading can ultimately be eliminated from the college level.

Studies relating to the psychology of reading.—A very significant summary of studies relating to the psychology of reading was prepared by Vernon (107). Reference to previous studies was supplemented by data from the author's experiments in the Cambridge Psychological Laboratories. The book should be read by all students of reading problems. Tinker (103) studied the effect of color on visual apprehension and perception and found that the luminosity contrast between the character to be apprehended and its background is a very important factor. Preston, Schwankl, and Tinker (84) also found that "the greater the luminosity or brightness difference between symbol and background the greater the legibility of the print (84:461). In a study of the influence of color of type and background on speed of reading, Tinker and Paterson (106) found that "a maximum brightness contrast between print and background" is essential. In a study of the influence of form of type on the perception of words, made also by Tinker (104), it was found "that total word form is more potent in the perception of words in lower case than in capitals where perception seems to recur largely by letters." In a study of mirror-reading, Tinker and Goodenough (105) reached the following conclusions concerning word perception: initial letters are much more important than intermediate or final letters; the context is often used in the final apprehension of difficult words and in checking between various alternatives suggested by imperfect or partial perception; word length is important in determining word form. Lowry (65) determined the intelligence quotients of pupils from scores on the Otis Intermediate Examination secured before and after three months of corrective and remedial training. Only 8 out of 50 failed to increase their I.Q.'s. The highest 25 percent made an average gain of 24 points. "This would seem to indicate that an I.Q. made on a group test may be largely a reading score."

Concluding Statement.—It has been impossible in the foregoing summary to include reference to all of the studies listed in the bibliography. An effort has been made, however, to direct attention to results of major importance.

Bibliography

In presenting the following annotated bibliography, the writer has taken the liberty of including a few studies published before July 1, 1931, which did not come to his attention early enough to be included in previous bibliographies.

1. Anderson, Margaret, and Kelley, Mae. "An Inquiry into Traits Associated with Reading Disability," *Smith College Studies in Social Work*, II (September, 1931), pp. 46-63.
Analyzes the records of 100 reading disability cases examined by Dr. Marion Monroe to determine various traits related to reading disability.

2. Bergman, W. G., and Vreeland, Wendell. "Comparative Achievement in Word Recognition under Two Methods of Teaching Beginning Reading," *Elementary School Journal*, XXXII (April, 1932), pp. 605-16.
Compares the progress, as measured by two tests, of two groups of first-grade pupils taught by the "Picture-Story Method" and a "visual method."

3. Berry, Betty Trier. "Improving Freshman Reading Ability," *English Journal*, XX (December, 1931), pp. 824-28.
Describes the results of remedial training in reading given in a college class.

4. Birdsall, Agnes. "Mental Habits in Reading," *Elementary School Journal* XXXII (May, 1932), pp. 681-90.
Describes the methods of diagnosis used in determining the mental habits of good and poor readers; discusses the methods and results of remedial treatment.

5. Bonar, Hugh S. "Segregation of 'Ability Groups' and Achievement on the First Grade Level," *Educational Method*, XI (June, 1932), pp. 531-36.
Reports the results of experiments continuing for three years to determine the merits of classifying pupils into ability groups for instruction in reading.

6. Brooks, Fowler D. "Predicting Scholarship in the Junior High School," *Eighteenth Annual Conference on Educational Measurements*, Bulletin of the School of Education, Indiana University, VII, No. 5 (Bloomington, Indiana: Bureau of Coöperative Research, Indiana University, School of Education, 1931), pp. 73-80.
Summarizes the results of studies to determine the relation to scholastic success of various factors including achievement in reading.

7. Brown, Robert. "Vocabularies of History and Reading Textbooks," *The Principal and Supervision*, Tenth Yearbook of the Department of Elementary Schools Principals (Washington: Department of Elementary School Principals of the National Education Association, 1931), pp. 408-11.
Presents the results of a comparative study of the vocabularies of 5 histories and 5 readers for sixth grade use with respect to the number of new words included, the length of words, and their rating on the Thorndike list.

8. Brown, Andrew W., and Lind, Christine. "School Achievement in Relation to Mental Age—A Comparative Study," *Journal of Educational Psychology*, XXII (November, 1931), pp. 561-76.
Compares the achievement of pupils of the same mental age but differing in intelligence quotients.

9. Browning, Mary, Howard, Bonnie C., and Moderow, Gertrude. "Supervisory Reading Program," *Educational Method*, XI (October, 1931), pp. 32-38.
Describes the results of tests given to the 2A grade and the methods used to improve instruction.

10. Butsch, Russell L. C. "Eye Movements and the Eye-hand Span in Typewriting," *Journal of Educational Psychology*, XXIII (February, 1932), pp. 104-21.
Analyzes eye-movement records to determine the nature of the movements made by the eye in following the copy in typewriting.

11. Cain, William R., and Brown, Francis J. "An Evaluation of the Outside Reading Interests of a Group of Senior High-School Pupils," *Journal of Educational Sociology*, V (March, 1932), pp. 437-42.
Reports the books read by the sophomore and senior pupils of a suburban high school and expresses judgment concerning their merit.
12. Camp, Cordelia. "An Oral-Reading Program in the Elementary Grades," *Elementary School Journal*, XXXII (February, 1932), pp. 435-41.
Discusses the importance of oral reading; describes the steps taken to improve achievement in grades IV to VII; reports the results attained.
13. Carter, Homer L. J. "An Attempt to Increase Reading Efficiency," *Educational News Bulletin* (Western State Teachers College, Kalamazoo, Michigan), II (June, 1932), pp. 13-19.
Reports the results of the diagnosis and remedial treatment of a boy seriously retarded in reading.
14. Chaudhury, Probodh Chandra Deb. *Word Frequency in Bengali and Its Relation to the Teaching of Reading*. Dacca University Bulletin, No. XIV. Ramna, Dacca, India: University of Dacca, 1931.
Reports the frequency of words in passages in Bengali containing 100,000 running words; applies the findings in a critical study of primers and in developing a new primer.
15. Cheney, O. H. "Readers or Book Buyers?" *Economic Survey of the Book Industry*, 1930-1931 (New York: National Association of Book Publishers, 1931), pp. 17-72.
Presents the results of a nation-wide survey to determine who and where are the readers, how readers are developed, the forces that promote book reading, etc.
16. Clark, Willis W. "An Experiment in Grading and Classifying Elementary Schools," *Third Yearbook of the Psychology and Educational Research Division*, School Publication No. 185 (Los Angeles, California: Los Angeles City School District, 1929), pp. 91-95.
Reports the steps taken in grading pupils on the basis of reading achievement and in providing instruction adapted to their needs.
17. Cooper, Ruby. "Overlapping of Content in Elementary Readers," *Elementary School Journal*, XXXII (March, 1932), pp. 542-45.
Summarizes the results of a study of the overlapping in 16 sets of recently published readers.
18. Coxe, Warren W. "Scientific Literature on the Reading Interests of School Children," *Library Journal*, LVII (January 1, 1932), pp. 9-15.
Summarizes in untechnical terms the results of various studies relating to the reading interests of children.
19. Crawford, C. C., and Gray, Lillian. "Measured Results of Activity Teaching," *Journal of the National Education Association*, XX (October, 1931), p. 270.
Reports the progress of fifth-grade pupils in reading achievement as a result of participating in a puppet-show activity for a half year.
20. Crosland, H. R. "Letter-Position Effects, in the Range of Attention Experiment, as Affected by the Number of Letters in Each Exposure," *Journal of Experimental Psychology*, XIV (October, 1931), pp. 477-507.
Reports the results of an experiment with 140 college sophomores to verify the conclusions reached in a similar experiment in 1928.
21. Cuff, Noel B., and Donovan, H. L. "What Freshmen Read in a Teachers College," *A.A.T.C. Quarterly*, I (September, 1931), pp. 8-14.
Presents the results of a survey of the reading interests of 330 freshmen.
22. Dale, Edgar. "Books Which Children Like to See Pictured," *Educational Research Bulletin* (Ohio State University), X (November 11, 1931), pp. 423-29.
Lists the books which children in grade four, or above, would like to see pictured and compares them with approved books.

23. Dale, Edgar. "Evaluating Thorndike's Word List," *Educational Research Bulletin* (Ohio State University), X (November 25, 1931), pp. 451-57.
Presents data supporting criticisms of the Thorndike word list.

24. Dale, Edgar. "A Comparison of Two Word Lists," *Educational Research Bulletin* (Ohio State University), X (December 9, 1931), pp. 484-89.
Compares the words included in the International Kindergarten list and in the first thousand of the Thorndike Word list.

25. Davidson, H. P. "An Exerimental Study of the Bright, Average, and Dull Children at the Four-Year Mental Level," *Genetic Psychology Monographs*, IX (March-April, 1931), pp. 119-289.
Reports the results of a study to determine if children with a mental age of four can learn to read, also the rate of progress of bright, average, and dull children of this age level.

26. Dietze, Alfred G., and Jones, George Ellis. "Factual Memory of Secondary School Pupils for a Short Article which They Read a Single Time," *Journal of Educational Psychology*, XXII (November and December, 1931), pp. 586-98, pp. 667-76.
Reports the results of an experiment to determine the effect of a single reading as measured by immediate and delayed factual memory of pupils in grades VII to XII.

27. Donovan, John J. "Selecting Primers for Non-English-Speaking Children," *Elementary School Journal*, XXXII (September, 1931), pp. 30-33.
Presents the results of tests given to children of foreign parentage to determine the vocabulary difficulty of eight primers.

28. Eames, Thomas Harrison. "A Comparison of the Ocular Characteristics of Unselected and Reading Disability Groups," *Journal of Educational Research*, XXV (March, 1932), pp. 211-15.
Reports the results of measurements of the visual acuity and coördination of the eyes of 114 reading disability cases and 143 unselected cases.

29. *Elementary School Journal*. "The Reading Interests of Junior High School Pupils," *Elementary School Journal*, XXXII (September, 1931), pp. 14-16.
Reviews a study by Anne Rinehart Campbell of the reading interests of 5,510 pupils completing the ninth grade of the Pittsburgh schools.

✓30. Eurich, Alvin C. *The Reading Abilities of College Students: An Experimental Study*, College Problems Series (Minneapolis, Minnesota: University of Minnesota Press, 1931), XVI + 208 pp. See also *English Journal* (College Edition), XXI (February, 1932), pp. 135-41, and *Journal of Higher Education*, III (June, 1932), pp. 315-17.
Reports the methods used and the results secured in studies among college freshmen to determine the value of intensive drills in paragraph reading and vocabulary.

31. Eurich, Alvin C. "An Experimental Program to Enlarge the Vocabularies of College Students," *Addresses Delivered During the Eighteenth Annual Schoolmen's Week*, Educational Research Bulletin, No. 3 (Minneapolis, Minnesota: Eta Chapter, Phi Delta Kappa, College of Education, University of Minnesota, 1931), pp. 22-24.
Summarizes the results of a study to determine the effect of vocabulary training given to 196 college freshmen.

32. Eurich, Alvin C. "A Method for Measuring Retention in Reading," *Journal of Educational Research*, XXIV (October, 1931), pp. 202-8.
Compares the results of retention tests given to college students before reading, after reading, and a week later.

33. Foran, T. G., and Rock, Robert T. Jr. *The Reliability of Some Silent Reading Tests*, Catholic University of America Educational Research Bulletins, V, No. 6 (Washington: Catholic Education Press, 1930), 24 pp.
Presents data from 83 seventh-grade pupils which show the reliability of six reading tests.

34. Garrison, K. C., and Bivens, Curtis. "Correlations between Various English Abilities and Intelligence," *Peabody Journal of Education*, IX (September, 1931), pp. 77-79.
Reports correlations between reading comprehension and other achievements in English for 122 senior high-school pupils.

35. Garrison, S. C., and Hackworth, Lector. "A Comparison of Ten Book Lists for Children's Reading," *Peabody Journal of Education*, IX (September, 1931), pp. 102-11.
Presents a list of books for each grade from I to VIII inclusive that are recommended in as many as four or more of ten graded book lists.

36. Garrison, S. C., and Heard, Minnie Taylor. "An Experimental Study of the Value of Phonetics," *Peabody Journal of Education*, IX (July, 1931), pp. 9-14.
Compares the progress for three years of two groups of primary pupils, one receiving training in phonetics and the other no such training.

37. Gatto, Frank M. "An Experiment to Evaluate the Effectiveness of Two Reading Systems in the First Grade," *Pittsburgh Schools*, VI (November-December, 1931), pp. 72-91.
Compares the progress of two groups of 1B pupils using different systems of beginning reading, as measured by five reading tests.

38. Gatto, Frank M. "The Experimental Trial of Certain Practice Lessons in Silent Reading of the Study Type," *Pittsburgh Schools*, VI (November-December, 1931), pp. 92-103.
Describes the preliminary use of practice exercises in silent reading in grades five and six and discusses their value when used in the ninth grade.

39. Goodenough, Florence L., and Tinker, Miles A. "The Retention of Mirror-Reading Ability after Two Years," *Journal of Educational Psychology*, XXII (October, 1931), pp. 503-4.
Reports the results of a study with four college students to determine the amount of retention in mirror reading two years after specific training was given.

40. Gray, Howard A., and Hollingworth, Leta S. "The Achievement of Gifted Children Enrolled and Not Enrolled in Special Opportunity Classes," *Journal of Educational Research*, XXIV (November, 1931), pp. 255-61.
Reports the results of three years of experimental work with superior children to determine the merits of segregation.

41. Gray, William S. "Reading," *Special Methods in the Elementary School, Review of Educational Research*, I, No. 4 (Washington: American Educational Research Association of the National Education Association, 1931), pp. 247-60.
Summarizes studies relating to methods of teaching reading in elementary schools.

42. Gray, William S. "Reading," *Psychology of the School Subjects, Review of Educational Research*, I, No. 5 (Washington: American Educational Research Association of the National Education Association, 1931), pp. 328-36.
Summarizes studies relating to the psychology of reading.

43. Gray, William S. "Reading and Literature," *Special Methods on High School Level, Review of Educational Research*, II, No. 1 (Washington: American Educational Research Association of the National Education Association, 1932), pp. 29-34.
Summarizes studies relating to reading and literature in secondary schools.

44. Gray, William S. "Summary of Reading Investigations (July 1, 1930, to June 30, 1931)," *Elementary School Journal*, XXXII (February, March, April, 1932), pp. 447-63, pp. 510-20, pp. 587-94.
Presents a bibliography of 115 scientific studies relating to reading and summarizes significant findings.

45. Gray, William S., Gray, Wil Lou, and Tilton, J. Warren. *The Opportunity Schools of South Carolina: An Experimental Study* (New York: American Association for Adult Education, 1932), 142 pp.
Presents data showing the progress of adults of limited education when favorable learning conditions are provided; compares the progress of those of different levels of capacity and initial achievement.

46. Haefner, Ralph. "Casual Learning of Word Meanings," *Journal of Educational Research*, XXV (April-May, 1932), pp. 267-77.
Reports the results of a controlled experiment with teachers college students to determine the value of casual contacts with words in learning their meanings.

47. Harring, Sydney. "What Primer Shall I Use Next?" *Elementary School Journal*, XXXII (November, 1931), pp. 207-13. See also correction in *Elementary School Journal*, XXXII (May, 1932), pp. 644-45.
Reports an analysis of fifteen primers to determine the number of different words, the total word content, the average amount of repetition, and the average number of new words per page.

48. Hermans, Mabel C. "Results of Free-Reading Experiments," *Los Angeles Educational Research Bulletin*, XI (February, 1932), pp. 82-88.
Compares the results of free reading and directed reading among six groups of junior high-school pupils; also presents case studies.

49. Hilliard, George H. "Extensive Library Reading versus Specific Drill as an Aid in Improving Certain Reading Abilities," *Educational News Bulletin* (Western State Teachers College, Kalamazoo, Michigan), II (June, 1932), pp. 6-12.
Describes the methods used and results secured in an experiment continuing for eight weeks with fifth-grade pupils in six public schools.

50. Hobson, Cloy S., and Parke, Wallace E. "Using a Group Test To Identify Types of Reading Difficulty," *Elementary School Journal*, XXXII (May, 1932), pp. 666-75.
Compares the scores of pupils in grades III to VI inclusive on the Monroe reading test when given (a) as prescribed, (b) without a time limit, and (c) orally.

51. Horrall, A. H. "Selected vs. Unselected Groups in Reading," *The Principal and Supervision*, Tenth Yearbook of the Department of Elementary School Principals (Washington: Department of Elementary School Principals of the National Education Association, 1931), pp. 444-47.
Describes the methods used and the results secured in a controlled experiment in the fifth and sixth grades to determine the value of homogeneous grouping.

52. Jacobs, Emilie V., and Liveright, Alice K. "The Improvement of Study-Type Reading," *The Principal and Supervision*, Tenth Yearbook of the Department of Elementary School Principals (Washington: Department of Elementary School Principals of the National Education Association, 1931), pp. 455-59.
Describes the results of 17 weeks of intensive training in study-type reading given to fourth, fifth, and sixth grade pupils.

53. Jacobson, Paul B. "The Effect of Work-Type Reading Instruction Given in the Ninth Grade," *School Review*, XL (April, 1932), pp. 273-81.
Describes the methods used and the results secured in efforts to improve the reading achievement of ninth grade pupils in reading in the field of general science.

54. Johnson, B. Lamar. "Adult Reading Interests as Related to Sex and Marital Status," *School Review*, XL (January, 1932), pp. 33-43.
Summarizes the results of a survey of the reading interests of 900 men and women of Duluth; considers the influence of sex and marital status on reading interests.

55. Johnson, B. Lamar. "Children's Reading Interests as Related to Sex and Grade in School," *School Review*, XL (April, 1932), pp. 257-72.

Summarizes the results of a survey of the reading interests of 1,856 boys and girls in grades V to IX in Duluth; compares findings with a previous survey of adult reading interests.

56. Johnston, Mason A. "Estimating the Reading Recognition Vocabulary," *California Quarterly of Secondary Education*, VII (January, 1932), pp. 173-77.
Describes a preliminary study among high school pupils to determine the relative sizes of their reading vocabulary in context and their definitional recognition vocabulary.

57. Jones, Effie Butler. "A Comparison of Comprehension Results in Oral and Silent Reading," *Peabody Journal of Education*, IX (March, 1932), pp. 292-96.
Compares the comprehension scores in oral and silent reading for pupils in grades III, V, and VII from five types of schools.

58. Kelty, Mary G. "A Suggested Basic-Vocabulary in American History for the Middle Grades," *Journal of Educational Research*, XXIV (December, 1931), pp. 335-49.
Presents a basic vocabulary in American history, and compares it with nine published lists of words.

59. Kraus, Henry M., and Harap, Henry. "The Musical Vocabulary of Newspapers and Magazines," *Journal of Educational Research*, XXIV (November, 1931), pp. 299-303.
Reports the frequency of musical terms found in over seven million running words in newspapers and magazines.

60. Lemon, Allan Clark. *An Experimental Study of Guidance and Placement of Freshmen in the Lowest Decile of the Iowa Qualifying Examination, 1925*. University of Iowa Studies in Education, III, No. 8 (Iowa City, Iowa: University of Iowa, 1927), 136 pp.
Reports the results of a study of 540 students in the lowest decile group in five different classes in the State University of Iowa, from 1920 to 1924.

61. Lewerenz, Alfred S. "Reading Material Evaluated by Means of the Vocabulary Grade Placement Formula," *Los Angeles Educational Research Bulletin*, XI (April, 1932), pp. 98-119.
Presents the grade placement of more than 250 books with respect to vocabulary difficulty and diversity through the use of the Lewerenz Vocabulary Grade Placement Formula.

62. Long, Howard H., and Mayer, Willa C. "Printing versus Cursive Writing in Beginning Reading Instruction," *Journal of Educational Research*, XXIV (December, 1931), pp. 350-55.
Compares the progress of two groups of (about) 500 first-grade pupils who were taught to read through the use of printing and cursive writing respectively.

63. Low, H. R. *Relation of Reading Comprehension to Arithmetical Ability*. Supplement to the Scottish Educational Journal, No. 6 (Edinburgh, Scotland: Scottish Council for Research in Education, December, 1931), 8 pp.
Presents the results of experiments to determine to what extent ability in solving arithmetical problems is correlated with ability to comprehend the significance of printed matter.

64. Lowry, Ellsworth. "Improving the Mechanics of Reading," *Elementary School Journal*, XXXII (January, 1932), pp. 364-68.
Summarizes the effect of ten weeks of time pressure drills on achievement in reading and arithmetic among pupils in grades IV-VIII inclusive.

65. Lowry, Ellsworth. "Increasing the I.Q.," *School and Society*, XXXV (February 6, 1932), pp. 179-80.
Reports the scores of fifty pupils on the Otis Intermediate Examination, before and after three months of corrective and remedial training in reading.

66. Lyman, R. L. *The Enrichment of the English Curriculum*, Supplementary Educational Monographs, No. 39 (Chicago: Department of Education, University of Chicago, 1932), pp. 8-57, 100-229.
Summarizes the results of efforts to broaden the scope of English instruction including reading and to improve teaching procedures in elementary schools, secondary schools, and colleges.

67. McAnulty, Ellen Alice. "Achievement and Intelligence Test Results for Japanese Children Attending Los Angeles City Schools," *Los Angeles Educational Research Bulletin*, XI (January, 1932), pp. 65-69.
Compares the achievement and intelligence test scores for 1,236 Japanese and 1,074 American children.

68. McCallister, James M. "Determining the Types of Reading in Studying Content Subjects," *School Review*, XL (February, 1932), pp. 115-23.
Summarizes the results of observations and analyses the materials and techniques of teaching junior-high-school history, mathematics, and general science to determine the types of reading required.

69. McCarty, Pearl Sands. "Increasing Comprehension in Silent Reading," *School Review*, XXXIX (December, 1931), pp. 758-66.
Describes the methods used and the results attained through special training in reading given to a ninth- and tenth-grade group; compares the progress with that of a controlled group.

70. McElwee, Edna Willis. "A Study of Retardation and Special Instruction in Reading," *Elementary School Journal*, XXXII (October, 1931), pp. 135-43.
Summarizes the results of special training given to two opportunity classes and to two reading-disability classes including grades I to V inclusive.

71. McElwee, Edna Willis. "A Study of the Reading Attainment of Children in Ungraded Classes," *Psychological Clinic*, XX (December, 1931), pp. 205-8.
Compares the progress of two groups of pupils to determine the possibility of growth in ungraded classes.

72. McGrath, Earl J. "The Three-Year Plan," *Journal of Higher Education*, II (June, 1931), pp. 283-88.
Shows the value of directed study and training in reading on rate and accuracy of interpretation among inferior and superior freshmen.

73. Mackintosh, Helen K. "Recent Data on Children's Interests in Poetry," *Elementary English Review*, VIII (January, 1931), pp. 18-20.
Summarizes the reaction of pupils in grades III to VI inclusive to 400 poems which were read to them.

74. Martin, Helen. *Children's Preferences in Book Illustrations*, Western Reserve University Bulletin, New Series, XXXIV, No. 10 (Cleveland, Ohio: Western Reserve University, 1931), 58 pp.
Presents a historical summary of book illustrations, reviews previous investigations, and reports the results of individual and group studies of preferences of children in grades I to IX.

75. Mellinger, Bonnie E. *Children's Interests in Pictures*, Teachers College Contributions to Education, No. 516 (New York: Teachers College, Columbia University, 1932), x + 52 pp.
Reports the preferences of 795 children in grades I, III and V, for realistic and conventionalized representations of various subjects and in different color combinations.

76. Merry, Ralph V. "An Experiment in Teaching Tactual Reading to Seeing Subjects," *Pedagogical Seminary*, XXXIX (September, 1931), pp. 407-13.
Reports the results of efforts of two undergraduate students of normal intelligence and vision to learn tactual reading.

77. Monroe, Marion. *Children Who Cannot Read: The Analysis of Reading Disabilities and the Use of Diagnostic Tests in the Instruction of Retarded Readers* (Chicago: University of Chicago Press, 1932), xvi + 206 pp.
Presents detailed diagnoses of 415 children who had special reading defects; compares findings with those for 101 children in an average school population.

78. Monroe, Walter S., and Engelhart, Max D. "Methods of Teaching Reading of Arithmetical Subject-Matter," *A Critical Summary of Research Relating to the Teaching of Arithmetic*, Bureau of Educational Research Bulletin No. 58, University of Illinois Bulletin, XXIX, No. 5 (Urbana, Illinois: University of Illinois, 1931), pp. 76-80.
Summarizes studies relating to the reading of arithmetical subject matter.

79. Moore, J. F. "A Study in Remedial Reading," *Pittsburgh Schools*, VI (January-February, 1932), pp. 123-26.
Reports the methods used and the results secured through fifteen weeks of remedial training in grades five and six.

80. Nelson, Louise. "A Medical Problem that Became a Psychological Problem," *Mental Hygiene*, XV (April, 1931), pp. 242-54.
Reports the case of a nineteen-year-old boy with a reading disability due to an eye injury at birth.

81. Patty, W. W., and Painter, W. I. "A Technique for Measuring the Vocabulary Burden of Textbooks," *Journal of Educational Research*, XXIV (September, 1931), pp. 127-34.
Reports a technique for measuring vocabulary burden based on the frequency of words in a sample, the Thorndike index number for the word, and the range of words in the sample.

82. Pierce, Paul R. "The Administration of First-Grade Reading in a Foreign Industrial Community," *Elementary School Journal*, XXXII (June, 1932), pp. 774-84.
Summarizes data from 1652 IB pupils which show that the administration of reading in foreign communities encounters difficulties not characteristic of other communities.

83. Pressey, L. C., and Moore, W. S. "The Growth of Mathematical Vocabulary from the Third Grade through High School," *School Review*, XL (June, 1932), pp. 449-54.
Presents the results of tests of meaning vocabulary in arithmetic, algebra, and geometry to determine growth through the grades.

84. Preston, Katherine, Schwankl, Howard P., and Tinker, Miles A. "The Effect of Variations in Color of Print and Background on Legibility," *Journal of General Psychology*, VI (April, 1932), pp. 459-61.
Reports distances at which 60 University students recognized each of 11 combinations of color in print and background.

85. Raybold, Emma. "Reading Readiness in Children Entering First Grade," *Third Yearbook of the Psychology and Educational Research Division*, School Publication No. 185 (Los Angeles, California: Los Angeles City School District, 1929), pp. 98-101.
Presents the results of an analytical and experimental study to determine the causes and prevention of non-promotion in the first grade.

86. Rebert, G. Nevin. "A Laboratory Study of the Reading of Familiar Numerals," *Journal of Educational Psychology*, XXIII (January, 1932), pp. 35-45.
Summarizes eye-movement records secured from 106 high-school and college subjects to determine "how familiar numerals are read when they appear in context."

87. Rebert, G. Nevin. "A Laboratory Study of the Reading of Familiar Formulas," *Journal of Educational Psychology*, XXIII (March, 1932), pp. 192-203.
Summarizes eye-movement records secured from 60 subjects to find out "how familiar formulas are read when they appear in verbal context."

88. Richards, T. W. "A Case of Reading Disability Due to Deficient Visual Imagery," *Psychological Clinic*, XX (June, 1931), pp. 120-24.
Discusses the results of the diagnosis and remedial treatment of a boy of superior intelligence but deficient in reading and spelling.

89. Robinson, F. P. "Can College Freshmen in the Lowest Tenth in Reading Be Aided Scholastically?" *School and Society*, XXXIV (December 19, 1931), pp. 843-46.

Summarizes the results of an experiment to determine the value of clinical analysis and treatment of reading deficiencies among freshmen ranking in the lowest tenth in reading ability.

90. Root, E. Raymond. *First-Grade Reading Survey of California Schools.* Hollywood, California: Southern California School Book Depository, Ltd., 1931.
Reports the results of tests given to 11,167 first-grade pupils of California to determine their achievement in reading and its relation to certain designated factors.

91. Sangren, Paul V. *Improvement of Reading through the Use of Tests,* Bulletin of the Western State Teachers College, XXVII, No. 1 (Kalamazoo, Michigan: Western State Teachers College, 1931), 208 pp.
Presents data relating to the use of reading tests in improving teaching; reviews existing silent reading tests and the factors involved in improving silent reading achievement.

92. *School Review.* "Should Study Hall and Library Be Separate?" *School Review,* XL (March, 1932), pp. 171-74.
Gives the percentages of pupils reporting different uses of reading material in the library of schools with combined and with separate library and study hall.

93. Shuttleworth, Frank K. *A Critical Study of Two Lists of Best Books for Children,* Genetic Psychology Monographs, XI, No. 4 (Worcester, Massachusetts: Clark University. April, 1932), pp. 247-320.
Compares the Winnetka Graded Book List and A Guide to Literature for Character Training with respect to grade placement and the relative worth and interest value of the books included.

94. Sibert, O. E. "Improvement of Reading in High School," *School Executives Magazine,* LI (October, 1931), pp. 61-63, 86.
Describes the steps taken in diagnosing the needs of 38 pupils in a small high school, the remedial measures adopted, and the results attained.

95. Sibley, Martha. "Individual Reading Method Adapted to the Grade Readers for Work Type Reading," *Educational Administration and Supervision,* XV (September, 1929), pp. 441-46.
Describes the steps taken and the results attained through a form of individualized teaching in a third grade.

96. Skinner, H. Clay. "The Relationship between Reading Ability and Class Marks in College Subjects," *Journal of Educational Research,* XVII (February, 1928), pp. 137-38.
Summarizes data from 165 college students to determine the relationship between class marks and scores on reading tests in psychology, economics, and poetry.

97. Siemons, Agnes. "Reading Ability of High-School Students," *English Journal,* XXI (April, 1932), pp. 299-302.
Describes the methods used and the results secured through three remedial techniques used for a month with 96 eleventh-grade pupils.

98. Smith, Madorah E. "The Direction of Reading and the Effect of Foreign-Language-School Attendance on Learning to Read," *Journal of Genetic Psychology,* XL (June, 1932), pp. 422-50.
Summarizes a study among 740 children and 112 adults in Honolulu to determine the effect of learning to read two languages simultaneously on the number and character of the errors made.

99. Stevens, B. A. "Problem Solving in Arithmetic," *Journal of Educational Research,* XXV (April-May, 1932), pp. 253-60.
Discusses the relationship between scores in silent reading in the fundamentals of arithmetic, in reasoning problems in arithmetic, and in general intelligence for pupils in grades III to VII.

100. Stockrahm, Roy L. *A Tentative Analysis of Learning to Read with a Study of the Reading Ability of College Freshmen* (Bloomington, Indiana: Graduate Council, Indiana University, 1932), 64 pp.

Presents a detailed analysis of the task of learning to read; reports the scores of 900 students on two reading tests and compares the achievement of good and poor readers.

101. Taylor, Cornelia D., and Tinker, Miles A. "The Effect of Luminosity on the Apprehension of Achromatic Stimuli," *Journal of General Psychology*, VI (April, 1932), pp. 456-58.
Summarizes comprehension scores for black, dark gray, and light gray letters secured in both homogeneous and heterogeneous series from 128 college students.

102. Thompson, William H. "An Experiment in Remedial Reading," *School and Society*, XXXIV (August 1, 1931), pp. 156-58.
Reports the methods used and the results secured through remedial training given to 273 freshmen in a teachers college.

103. Tinker, Miles A. *The Effect of Color on Visual Apprehension and Perception*, Genetic Psychology Monographs, XI, No. 2 (Worcester, Massachusetts: Clark University, 1932), pp. 61-136.
Reports the results of studies with 200 adults to determine the influence of affective value, attention value, and luminosity of colors on comprehension and perception of symbols.

104. Tinker, Miles A. "The Influence of Form of Type on the Perception of Words," *Journal of Applied Psychology*, XVI (April, 1932), pp. 167-74.
Reports the results of experiments with six students to determine the influence of lower case, italics, and capitals on the perception of words.

105. Tinker, Miles A., and Goodenough, Florence L. "Mirror Reading as a Method of Analyzing Factors Involved in Word Perception," *Journal of Educational Psychology*, XXII (October, 1931), pp. 493-502.
Describes the results of a learning experiment with five adults in reading prose from the reversal image in a mirror to determine factors influencing word perception.

106. Tinker, Miles A., and Paterson, Donald G. "Variations in Color of Print and Background," "Studies of the Typographical Factors Influencing Speed of Reading, VII," *Journal of Applied Psychology*, XV (October, 1931), pp. 471-79.
Presents data from 850 college students showing effect of ten color combinations of print and background on speed of reading.

107. Vernon, M. D. *The Experimental Study of Reading* (London: Cambridge University Press, 1931), xvi + 190 pp.
Presents a concise summary of experimental studies, particularly those recently performed, relating to the psychology of reading.

108. Voorhis, Thelma G. *The Relative Merits of Cursive and Manuscript Writing*, Lincoln School Research Studies (New York: Teachers College, Columbia University, 1931), x + 58 pp.
Compares the progress in learning to read of two groups of first-grade pupils, one of which used manuscript letter forms and the other cursive writing.

109. Waples, Douglas. "Reading Studies Contributory to Social Sciences," *Library Quarterly*, I (July, 1931), pp. 291-300.
Discusses significant reading problems which should serve as a basis for coöperative research among students of librarianship and those interested in the social sciences.

110. Waples, Douglas. "The Relation of Subject Interests to Actual Reading," *Library Quarterly*, II (January, 1932), pp. 42-70.
Summarizes data from groups of textile workers and students showing the relation of the reader's expressed interests in subjects and his actual reading.

111. Warren, Julius E. "Curriculum-making in Reading Based on the Results of Standardized Tests," *Elementary School Journal*, XXXII (March, 1932), pp. 504-9.

Summarizes the results of tests given in grades I to IX inclusive; describes changes made in instruction to improve achievement among pupils ranking high in intelligence.

112. Weglein, David E. "Remedial Reading in the Junior High School," *One Hundred and Second Annual Report of the Board of School Commissioners of Baltimore City to the Mayor and City Council for the Scholastic Year Ending June 30, 1931, and the Fiscal Year Ending December 31, 1930*, pp. 92-99.
Reports initial reading scores of poor readers in the junior high school and the improvement resulting from three months of remedial training.

113. Weglein, David E. "Growth in Reading Ability of Certain Junior High Pupils," *One Hundred and Second Annual Report of the Board of School Commissioners of Baltimore City to the Mayor and City Council for the Scholastic Year Ending June 30, 1931, and the Fiscal Year Ending December 31, 1930*, pp. 100-104.
Presents records of the progress in reading of junior high-school pupils as a result of remedial training during a three-year period.

114. Witty, Paul A. "The Reading Interests and Habits of Five Hundred Adults," *Education*, LII (May, 1932), pp. 554-62.
Summarizes the reports of the reading and reading interests of 503 adult women showing the relation of economic status to the amount and type of material read.

115. Witty, Paul A., and Lehman, Harvey C. "A Study of the Reading and Reading Interests of Gifted Children," *Journal of Genetic Psychology*, XL (June, 1932), pp. 473-85.
Describes the results of studies extending over five years to determine the reading habits and interest of 50 superior children in grades III to VII when the study began.

116. Woodring, Maxie N., and Flemming, Cecile White. "A Supplementary Bibliography on Study," *Teachers College Record*, XXXIII (March, 1932), pp. 515-32.
Presents an annotated bibliography on study, including experiments published since 1928.

117. Woods, Elizabeth T. "Special Classes for 'Non-Readers': Opportunity C Rooms," *Fourth Yearbook of the Division of Psychology and Educational Research*, School Publication No. 211 (Los Angeles, California: Los Angeles City Schools, 1931), pp. 99-105.
Describes the characteristics of non-readers and presents records of the progress of 78 cases as a result of specific instruction for one year.

118. Woody, Clifford. "Nature and Amount of Arithmetic in Types of Reading Material for the Elementary Schools," *Educational Outlook*, VI (May, 1932), pp. 199-217.
Reports the results of an analysis of 12,944 pages of material in 38 textbooks and 9 magazines for use in grades III to VIII.

RELATIVE DIFFICULTY OF JUNIOR HIGH SCHOOL SOCIAL STUDIES TEXTS

JOHN FRANCIS CRAMER
Superintendent of Schools, Grants Pass, Oregon

RECENTLY there has been a great deal of interest in unified social-studies courses for the junior high school. Such courses are designed to replace separate courses in history, geography, and civics. With this end in view much curriculum work has been done including the writing of textbooks.

When history, civics, and geography are taught as separate subjects, there is a possibility that pupils may not completely grasp the unity which underlies this field of thought. The purpose of unified social-studies programs is to enable pupils to perceive this unity and to understand the origin and development of modern life as a whole. In order that this result may be attained it is held that diverse factors that effect modern life should be considered together.

For the past two years in the Washington Junior High School in Grants Pass an experiment in unified social studies has been carried on in the seventh and eighth grades. The texts written by Dr. Harold Rugg of Columbia University have served as the basis of the course. These texts offer one volume and an accompanying workbook for each semester.

Two criticisms have been made of the course offered in these books. The first is that there is too much material in each book to cover in one semester, especially if the workbooks are used; and the second, that the vocabulary of the books is too difficult for pupils in the seventh and eighth grades. An attempt has been made in Grants Pass to study the validity of these criticisms in our local situation.

In the seventh grade the unified course replaces history and geography, in the eighth it replaces history and civics. Our daily schedule comprises seven 45-minute periods, with three-minute intervals between periods. Each class meets approximately ninety days a semester. In the fall of 1929, an attempt was made to teach the new course by devoting five periods a week to it, the same amount of time that had formerly been given to history alone and to geography alone. As a result the teachers found themselves crowded for time and unable to cover the entire course.

The new social-studies course, although it was replacing two subjects, had been allotted only five 45-minute periods a week, or sixty-seven hours a semester. The two subjects had taken two periods, or ninety minutes a day. In the second semester, therefore, a class was organized on the

double-period basis, and the full ninety minutes were allowed for the social-studies course. This gave plenty of time to complete the text and workbook and it allowed extra time for outside projects.

In the teacher's guide, the author of the texts says that ninety to ninety-five class periods of from sixty to seventy minutes should be allotted to each book. This allows from ninety to one hundred ten hours per semester. Under our second plan we had allowed one hundred thirty-four hours. Another arrangement was then attempted. Under this plan we allotted eight periods a week to the social-studies course, five for text-book work and three for the workbook, with variations when necessary. Such an arrangement was also found to permit classes to cover the text and workbook without difficulty.

This last plan (which we are now following in grades seven to nine), allows one hundred eight hours for the unified course. Its successful operation indicates that the author is substantially correct in his estimate of the time required. If it is attempted to teach the unified social studies in the same time that was given to one subject of the course under the former plan, the first criticism, namely, that the full course cannot be covered in a semester, will probably be found to be valid. When, however, the course is allowed even somewhat less time than is usually devoted to the subjects it displaces, the complaint loses its force.

The grounds for the second criticism of the Rugg books, namely, that they are too difficult, were investigated by applying the technique of Vogel and Washburne.[1] These authors employ an objective method of determining the grade placement of children's reading material. The method, in brief, is as follows: Make a sampling of one thousand words from the book; from this sample determine the number of different words, the number of prepositions, and the number of words not in Thorndike's (10,000) Word List. Also determine the number of simple sentences in a sampling of seventy-five sentences from the text.

Then apply the following regression equation to the data: X_1 being the reading score needed to understand the text; X_2 the number of different words in 1,000; X_3 the number of prepositions in 1,000 words; X_4 the number of uncommon words in 1,000; and X_5 the number of simple sentences in 75:

[1] Vogel, Mabel, and Washburne, Carleton. "An Objective Method of Determining Grade Placement of Children's Reading Material," *Elementary School Journal*, XXVIII (January, 1928), pp. 373-381.

$$X_1 = .085X_2 + .101X_3 + .604X_4 - .411X_5 + 17.43$$

Let us apply this equation to the history text which we had previously used in the seventh and eighth grades.

Number of different words in 1,000..... 504
Number of prepositions in 1,000..... 157
Number of uncommon words in 1,000.... 32
Number of simple sentences in 75..... 46

$$X_1 = (.085)(504) + (.101)(157) + (.604)(32) - (.411)(46) + 17.43 = 76.549$$

The reading score necessary for the ready comprehension of the book is 77 to the nearest whole number. More specifically this means that the pupil, in order to read the book with ease and comprehension, should reach that score on the paragraph meaning section of the Stanford Achievement Test. The reading score may be translated into reading grade according to Table I, taken from Vogel and Washburne.

TABLE I

GRADE STANDARDS—PARAGRAPH MEANING SECTION OF THE STANFORD ACHIEVEMENT TEST

(from Vogel and Washburne)

Scores	Grade
4-16	II
18-34	III
36-52	IV
54-62	V
64-70	VI
72-78	VII
80-86	VIII
88-94	IX
96-102	X
104-112	XI

The history under consideration is thus found to be suitable for children in the middle or latter part of the seventh grade. The four Rugg textbooks, as well as the texts which had been displaced, were checked in the same way. The displaced texts included, in addition to the history

TABLE II

DEVELOPMENT OF READING SCORE FOR EIGHT TEXTS

Book	X_2	X_3	X_4	X_5	X_1
U. S. History	504	157	32	46	77
Civics	438	140	24	39	67
Geography	620	140	30	32	89
State History	460	130	31	35	74
Rugg, Vol. I	435	155	20	37	67
Rugg, Vol. II	442	149	20	45	64
Rugg, Vol. III	484	142	27	38	74
Rugg, Vol. IV	480	144	20	45	71

book already mentioned, a geography text, a civics text, and a state history. The results obtained are shown in Table II.

A comparison is made in Table III of the reading grade of each book compared with the actual grade in which the book is used. From this it is possible to determine (1) whether or not the unified texts are more difficult than the older texts they replace; and (2) whether in any instance they are too difficult for the grade in which they are used.

TABLE III

READING SCORES AND GRADE PLACEMENT

Book	X_0	Reading Grade	Actual Grade Placement
U. S. History	77	7A	7B-8A
Civics	67	6B-6A	8B-8A
Geography	89	9B	6B-7A
State History	74	7B	6B-6A
Rugg, Vol. I	67	6B	7B
Rugg, Vol. II	64	6B	7A
Rugg, Vol. III	74	7B	8B
Rugg, Vol. IV	71	7B	8A

Our conclusions based upon two years' use of the unified social-studies texts, and upon the experiments given above, are as follows:

(1) If an amount of time suggested by the time allotted to the displaced subjects is given in the daily program, the unified course does not offer too much material to permit the completion of each book together with its accompanying workbook in one semester.

(2) The older, state-adopted texts were in two out of four cases too difficult for the grades in which they were placed, and in another case were too difficult for the grade in which the book was begun.

(3) The unified texts, in every instance except one, graded lower in difficulty than the texts displaced.

(4) The unified text for any grade is simple enough to be used in a grade one or two semesters lower than the grade to which it is usually assigned.

THE GROWTH AND NATURE OF RESEARCH INTEREST IN ARITHMETIC AND READING

WILLIAM A. BROWNELL
Duke University

For those who are interested in the development and extension of critical and quantitative methods of studying educational problems there is reason for considerable satisfaction in the rapidly mounting number of such investigations which are being reported. The bibliographical summaries which are now being made available annually reveal substantial and steady increases from year to year in this type of educational endeavor. The data assembled in Table I describe the situation in the fields of arithmetic and reading.

This table has been derived from the summaries of Buswell and Judd[1] in arithmetic, and of Gray[2] in reading. The totals in Table I do not correspond exactly with those of the authors whose bibliographies provided the basis for this study. The original monographs, summarizing all studies "judged to be worth while" to the date of publication,

TABLE I

SUMMARY OF ARITHMETIC AND READING INVESTIGATIONS BY THREE-YEAR PERIODS, 1888 TO 1929 INCLUSIVE

Three-year period	Number of arithmetic investigations		Number of reading investigations	
	By three-year periods	Cumulative totals	By three-year periods	Cumulative totals
Before 1888		3*		1**
1888	0	3	1	2
1891	6	9	1	3
1894	6	15	4	7
1897	11	26	4	11
1900	8	34	6	17
1903	10	44	4	21
1906	12	56	11	32
1909	17	73	10	42
1912	49	122	23	65
1915	64	186	72	137
1918	50	236	84	221
1921	49	285	161	382
1924	134	419	183	565
1927	156	575	309	874

* Actual dates: 1876, 1883, and 1886.
** Actual date: 1884.

[1] Buswell, Guy T., and Judd, Charles H. *Summary of Educational Investigations Relating to Arithmetic*, Supplementary Educational Monographs, No. 27 (Chicago: University of Chicago, 1925), 212 pp.

[2] Gray, William S. *Summary of Investigations Relating to Reading*, Supplementary Educational Monographs, No. 28 (Chicago: University of Chicago, 1925), 276 pp.

appeared in 1925. Since that time Buswell and Gray have continued, in a series of annual supplements, to summarize the "worth while" investigations reported in these fields each year. It was necessary, for the purposes of this study, to re-tabulate the separate investigations in three-year periods according to the date of actual publication of the investigations rather than according to the date of the summary. Thus, if an investigation, really completed and published in the year 1926, was included in the summary for 1927, the first date was here used for placing the investigation.

The figures reported in Table I differ in two other important respects from those reported by Buswell and Judd and by Gray. The first of these differences is that here all unpublished studies (such as term papers, M.A. theses, etc.) have been omitted. It seemed wise to adopt this rule, first, because actual publication and general availability seemed to constitute the soundest criterion of real research interest as it is here defined, and, second, because such a criterion could be uniformly applied. Buswell ceased reporting unpublished theses in 1925, and Gray in 1929. Furthermore, there is no assurance that the number of these unpublished investigations was complete even for the years in which they were embraced in the summaries.

The second important difference in methods of tabulating lies in the present practice of counting a given study only once regardless of the number of times such a study appeared in different places. Admittedly it is by no means certain that this rule was applied with complete success. It is not infrequent for an author to re-publish a study a number of times, and from the data at hand it was not always possible to determine when two reports which appeared to be identical, were actually so. When the best evidence was for identity, however, only the first report was included.

"Number of investigations" is not completely satisfactory as a measure of interest in research. Clearly, such a crude measure, which is obtained by counting all investigations alike, fails to take account of such important considerations as extent of the study, degree of expertness and quality of critical thinking, value of the contribution, if any, and so on. However, despite its coarseness as a measure, "number of investigations" has the distinct advantages of being intelligible and of being readily represented in quantitative terms.

The facts as set forth in Table I are of some importance. In the first place, the total number of investigations in the two subjects is impressive.

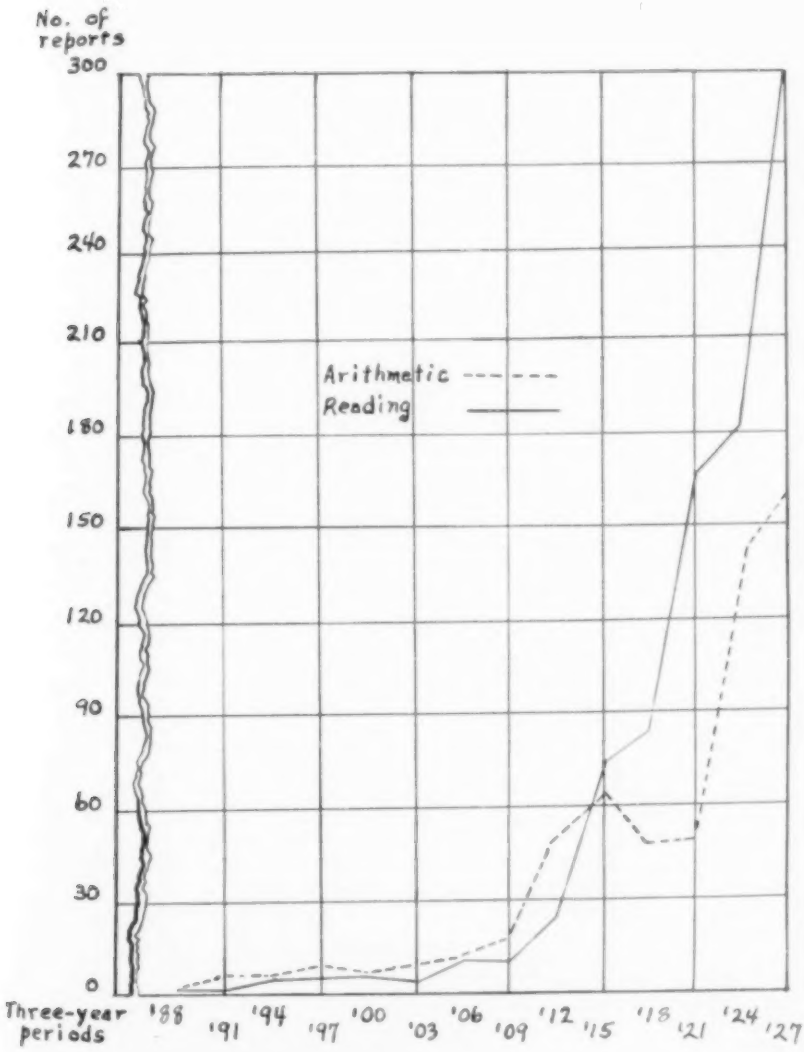

FIGURE I

NUMBER OF DIFFERENT REPORTS IN ARITHMETIC AND READING, BY THREE-YEAR PERIODS

By the end of 1929 there were in print the reports of 575 investigations in arithmetic and of 874 in reading. These figures reveal, as do few other indexes as simple as these, the extent to which the so-called "scientific movement" has progressed in education, and they effectively testify to the enormous amount of labor and to the seriousness of effort which has gone into the study of teaching and learning in these two fields. Viewed in such terms, educational research takes on no small measure of dignity.

A second fact to be derived from the table is related to the rate of growth of interest in educational research. It comes as something of a shock to learn, or to be reminded, that prior to 1888 there had been only three quantitative studies made in arithmetic and only one in reading. These data well emphasize in concrete form the youth of the scientific movement in education. At the turn of the century only twenty-six investigations had been reported in arithmetic and eleven in reading. Stated otherwise, over 95 percent in arithmetic and over 98 percent in reading of all the investigations made available through publication up to and including 1929 were produced after 1900.

The third fact of importance to be obtained from this tabulation is perhaps best presented through the curves in Figure I, which were plotted from the data in Table I. Both curves, for arithmetic and for reading, are relatively flat until after 1909. That is to say, the scientific movement, at least in these two subjects, did not really begin to attain popularity before the second decade of this century, and as a consequence, educational research perhaps may be less well described as a youth than as an infant. The first point of rise in the curves, less than 25 years ago, will be identified with the beginning of the measurement movement in education. The results of this movement are to be seen, quantitatively, in the increase in the number of studies after 1910 and, qualitatively, in the titles and contents of the reports which appeared after that date.

The war period had its effect on educational research in a slowing of the rate of production until after 1921, when, as shown in Figure I, the curves suddenly shoot upward in an unprecedented manner. Reference to the data in Table I shows that 290 of the 575 studies in arithmetic were made in the six-year period between 1924 and 1930. The corresponding figure for reading is 492 out of 874. The "quantity production" in these years supplied in both fields as many investigations as were made in all the years preceding 1924. It is unlikely that the curves will soon turn downward, or stated in different terms, that inter-

est in research may be expected to flag within the next few years. Buswell reports 64 studies in arithmetic for 1930, and Gray reports 91 studies in reading for the same year. If these yearly totals may be taken as typical of what is to be anticipated for all of the current three-year period, the totals may approximate 200 for arithmetic and 300 for reading.

The situation has been described for only two subjects, arithmetic and reading. That much the same features characterize the whole field of education is clear from the most excellent study made by Monroe[3] and others. Summarizing reports of educational research exclusive of those appearing as periodical articles "and certain other materials," these authors find that a total of 3714 studies were completed in the period 1918-1927. "If reports of research published as articles in periodicals and all unpublished studies had been included, the total would probably have been twice as large. Similar data are not available for the period 1908-17, but it is certain that the number of reports of educational research and related publications would be much less than the total for the period 1918-27. It seems reasonable to estimate that the number for the earlier period was not more than one-fourth of the total for the latter."[4]

Further data on the growth of popular interest in educational research will be found in a tabulation of reports by years for the period 1918-27.[5] Curves,[6] based on these data and printed in the Monroe study, are here presented because of their relevancy to the present discussion. Referring to these curves, Monroe[7] writes, "It is clear that the rapid increase in production began about 1922." The similarity of the findings of this comprehensive study by Monroe and those of this more limited study is at once apparent.

So much for the favorable side of the ledger. The data presented convincingly demonstrate the comparative newness of the scientific movement in education, its rapid growth, and the extent of its present popularity. But there is another side to the ledger which is not so favorable.

---

[3] Monroe, Walter S., and others. *Ten Years of Educational Research, 1918-27*, University of Illinois Bulletin, XXV, No. 51 (Urbana: Bureau of Educational Research, University of Illinois, 1928), 367 pp.

[4] *Ibid.*, p. 46. The estimate is remarkably accurate, if the data assembled in this study are an adequate sample. A total of 241 investigations were reported in arithmetic and reading together for the years 1908-17. This number is 30 percent as large as the total (800) for the years 1918-27.

[5] *Ibid.*, p. 48.

[6] *Ibid.*, p. 49.

[7] *Ibid.*, p. 46.

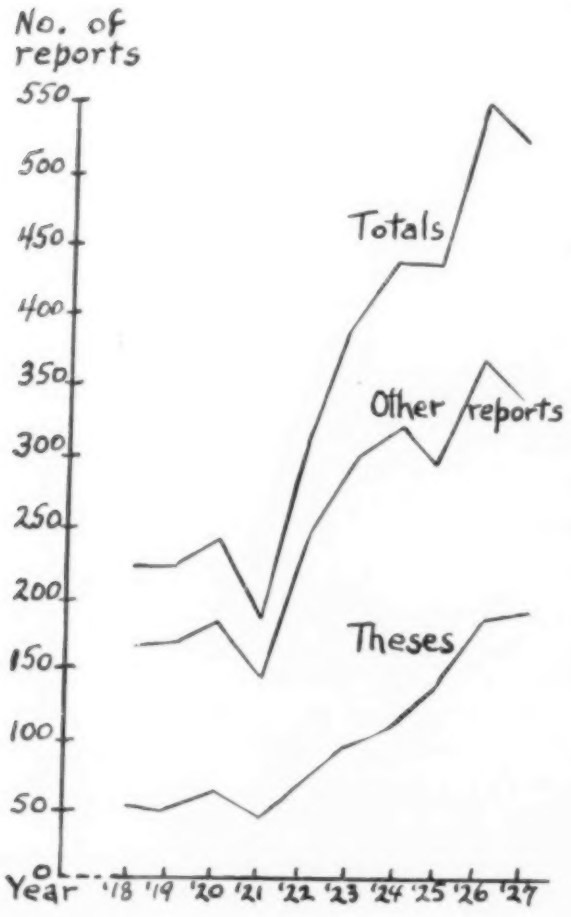

FIGURE II

NUMBER OF THESES, OTHER REPORTS, AND TOTALS INCLUDED, BY YEARS (FROM MONROE)

There is reason to believe that conditions underlying this appearance of healthiness may not be so encouraging as may be assumed.

The annotated bibliographies to which reference has already been made afford a means of analyzing the authorship of the various contributions which have been reported in the fields of arithmetic and reading. One type of analysis is presented in Table II for arithmetic and

in Table III for reading. The method of reading these tables may be illustrated from Table II. Before 1888 four different arithmetic "author-reports" had appeared in print; of this number three, or 75 percent, were written by authors who never made another study in arithmetic, and so on. The one term, "author-report," which is the basis for all the percent computations, requires some explanation. Reference to Table I reveals that before 1888 only *three* different reports in this field had been published. One of these reports, however, was the joint product of two different authors. There being no satisfactory manner of assigning proportionate credit as between the two authors, this particular report is, for the purposes of Table II, counted twice as two "author-reports." The total number of "author-reports" for the years preceding 1888 is, therefore, entered in Table II as four instead of the three recorded in Table I. In the preparation of Table II (and of Table III as well) this practice was followed in each case of joint authorship. If two individuals coöperated in writing one report, the report is counted as two "author-reports;" if three writers coöperated, the published account yields three "author-reports," and so on. The consequence of this procedure is to raise considerably the figures representing the number of reports both for the three-year periods and for the total length of time under study.

TABLE II

ARITHMETIC: NUMBER AND PERCENT OF REPORTS BY ONE-STUDY AUTHORS, BY THREE-YEAR PERIODS

Period	Data by three-year periods			Cumulations		
	Total number author-reports*	Number by one-study authors	Percent by one-study authors	Total number author-reports	Number by one-study authors	Percent by one-study authors
Before 1888	4	3	75.0	4	3	75.0
1888	0	0		4	3	75.0
1891	6	3	50.0	10	6	60.0
1894	7	3	42.9	17	9	52.9
1897	13	6	46.2	30	15	50.0
1900	8	4	50.0	38	19	50.0
1903	11	6	54.5	49	25	51.0
1906	13	10	76.9	62	35	56.5
1909	17	3	17.6	79	38	48.1
1912	56	20	35.7	135	58	42.9
1915	75	30	40.0	210	88	41.9
1918	51	27	52.9	261	115	44.1
1921	54	26	48.1	315	141	44.8
1924	165	76	46.1	480	217	45.2
1927	177	98	55.4	657**	315	47.9

* See p. 435 of the article for definition of this term.

** The total here, as well as the totals for the various periods, differs from the total in Table I because of the use here of "author-reports" as the unit, in place of "reports."

The data in these tables serve to make one considerably less complacent regarding the present status of educational research. Attention is first directed to the last lines of the tables. There one discovers that 55.4 percent of the arithmetic author-reports appearing in the years 1927-29 were the first and only efforts of their writers, and that 47.9 percent of *all* the arithmetic author-reports which had been printed up to the end of 1929 were, similarly, the work of one-study authors. The corresponding figures for reading (59.5 percent and 51.0 percent) are in substantial agreement. There is small reason for satisfaction in the thought that about one-half the available critical and quantitative writing on these subjects has been done by individuals who never before had written anything in these fields and by those who have not been enough interested in their topics or even in the general field of their topics to follow up their first ventures with other serious work.

TABLE III

READING: NUMBER AND PERCENT OF REPORTS BY ONE-STUDY AUTHORS, BY THREE-YEAR PERIODS

Period	Data by three-year periods			Cumulations		
	Total number author-reports*	Number by one-study authors	Percent by one-study authors	Total number author-reports	Number by one-study authors	Percent by one-study authors
Before 1888	1	1	100.0	1	1	100.0
1888	1	1	100.0	2	2	100.0
1891	1	1	100.0	3	3	100.0
1894	5	3	60.0	8	6	75.0
1897	4	3	75.0	12	9	75.0
1900	6	3	50.0	18	12	66.7
1903	6	4	66.7	24	16	66.7
1906	11	6	54.5	35	22	62.9
1909	10	8	80.0	45	30	66.7
1912	26	13	50.0	71	43	60.6
1915	24	38	45.2	155	81	52.3
1918	96	46	47.9	251	127	50.6
1921	186	66	35.5	437	193	44.2
1924	232	116	50.0	669	309	46.2
1927	385	229	59.5	1054**	538	51.0

* See p. 435 of the article for definition of this term.
** See corresponding footnote for Table II.

It is readily admitted that too much weight should not be attached to the data for the last three-year period. Some of the authors who made their first contributions in this period may confidently be expected to make other studies in the coming years. It is not, however, necessary to base any conclusion on the data for these more recent years alone. Tables II and III contain the data for three-year periods as far back as 1888 and the cumulations from that year through 1929. If one, in order to be fair, goes back to the period 1918-20, thus allowing nine years

for the appearance of subsequent reports, he finds that the situation at that time was not materially different from the situation as described for 1929. Then as now about fifty percent of all the articles that had appeared and were appearing were written by persons who had not previously published and who have not since published anything else in the given field.

The data in Tables II and III raise a question concerning the general productivity of writers on arithmetic and reading. An answer to the question is provided in Table IV. Here is to be found a classification of the 400 authors who, singly or in association with others, had published arithmetic reports before 1930, and of the 730 authors who had published reading reports. The basis of the classification is the number of reports for which, wholly or in part, they are responsible. It is a striking fact that in both fields only three authors have contributed fifteen or more reports. In the case of arithmetic only seven, and in the case of reading only five, have made ten or more contributions. The large numbers of authors are to be found at the bottom of the columns. In arithmetic, 315 of the 400 different authors, or 78.8 percent have published but a single study. The corresponding percent for reading authors is 78.2 percent. The cumulative percents in the last columns of the table show that only about 20 percent of the authors in the two fields have more than two studies to their credit.

One would ordinarily assume that the standing of an individual in his field might well be measured by his productivity in that field. That

TABLE IV

NUMBER OF DIFFERENT REPORTS CONTRIBUTED BY WRITERS IN FIELDS OF ARITHMETIC AND READING

Number of articles per author	Number of authors		Cumulative percents	
	Arithmetic	Reading	Arithmetic	Reading
15, and more	3	3	.8	.4
14	2	0	1.3	.4
13	0	2	1.3	.7
12	0	0	1.3	.7
11	1	0	1.5	.7
10	1	0	1.8	.7
9	2	2	2.3	1.0
8	2	1	2.8	1.1
7	2	2	3.3	1.4
6	4	8	4.3	2.5
5	4	12	5.3	4.1
4	8	10	7.3	5.5
3	12	28	11.3	9.3
2	44	91	21.3	21.8
1	315	571	100.0	100.0
Total	400	730	....	....

is, a writer who ranks in the highest ten percent among the workers in this field so far as number of published articles is concerned might, one would suppose, be properly regarded as an expert in that field. The application of this criterion to the data in Table IV would mark as "experts" individuals who had made no more than three or four studies in arithmetic or reading. "Expertness," on this basis, is cheaply bought.

Table V is designed to carry farther the rather rough analysis begun in Table IV. In the latter table all authors are combined regardless of the time of their contributions. Such a treatment tends to conceal possibly important variations and trends from year to year. To discover whether there are any such variations and trends, and more specifically, to determine whether authors in these fields are becoming generally more or less prolific, the authors were re-distributed according to the years of their contributions. In this way due recognition was given the productivity of an author who, for example, published in 1910, 1912, and 1917, first, by tabulating him as an author in each of these years and, second, by calling him in each case a more-than-one-study-author. According to Table V, then, of the four arithmetic authors who published before 1888 three, or 75 percent, had not published before and have not published since; of the six arithmetic authors in the period 1891-93 three, or 50 percent, were one-study authors, and the other three published other studies before that period, in that period, or afterward.

The percent columns for arithmetic and reading contain the important data. The fluctuations from three-year period to three-year

TABLE V

NUMBER AND PERCENT OF ONE-STUDY AUTHORS BY THREE-YEAR PERIODS, ARITHMETIC AND READING

Period	Arithmetic			Reading		
	Total number authors	No. one-study authors	Percent one-study authors	Total number authors	No. one-study authors	Percent one-study authors
Before 1888	4	3	75.0	1	1	100.0
1888	0	0	...	1	1	100.0
1891	6	3	50.0	1	1	100.0
1894	7	3	42.9	4	3	75.0
1897	11	6	54.5	4	3	75.0
1900	10	4	40.0	6	3	50.0
1903	11	6	54.5	6	4	66.7
1906	13	10	76.9	11	6	54.5
1909	17	3	17.7	9	8	88.9
1912	45	20	44.4	25	13	52.0
1915	66	30	45.5	73	38	50.7
1918	47	27	57.4	87	46	52.9
1921	43	26	60.5	157	66	42.0
1924	129	76	58.9	203	116	57.1
1927	158	98	62.0	374	229	61.2

period (75.0 percent,—, 50.0 percent, etc., in the case of arithmetic) prevent the forming of a distinct impression. In order to make readier comparisons, 45.5 percent, the median of the seven percents for the seven three-year-periods between 1900 and 1920, may be taken as representative of the percent of one-study authors in arithmetic for those twenty-one years. This figure may be compared with 58.9 percent, the median for the last three three-year periods. In like manner, 52.9 percent is representative of the 1900-20 period in reading, and 57.1 percent for the 1921-29 period.

As has already been stated in another connection, these pairs of figures for the two periods are not exactly comparable. The figures for one-study authors for the last nine-year period are too high; they will be lowered by the later contributions of some authors who made their first study in this period. Still, when due allowance has been made for such necessary reduction, these figures provide little evidence that the new recruits to educational research are any more prolific in studies than their predecessors have been.

In the light of these facts derived from Table V the reader should now refer again to the curves in Figure I. The rapid rise in the curves after 1920 is apt to be cited as proof of a marked increase in interest in educational research. Such citation is proper when by increase in interest is meant a *spread* of interest,—the fact that many more people than ever before are now engaged in making critical and quantitative investigations. The curves do not rise after 1920 because the earlier workers, maintaining their interest, have steadily and persistently pursued their studies and have, year after year, published the reports of their progress. Rather, the curves rise because each year there have been added many new workers who, from the standpoint of depth and persistence of interest, seem to represent no improvement at all over those who have preceded them.

It is not the contention of this paper that the great increase in extent of interest in educational research is wholly without merit and advantage. On the contrary, educational science has undoubtedly been advanced by the accession of the large number of new contributors of studies, even though these studies are limited to a single one per contributor. It is probably true that the making of but one study is of worth, not only for the additions made thereby to general knowledge, but also for the valuable effects on the producer of the study. Such a person is likely, as the result of his experience, to understand more

clearly the nature of research, to appreciate better the need of careful investigation, to accept more quickly and to apply more confidently the findings of expert inquiries, and even perhaps to be more "experimentally minded" toward his educational tasks, whether instructional or administrative. All this is freely granted. At the same time it may be insisted that this is not enough. *Depth* is as important a dimension as is *extent* in measuring growth in research interest. However valuable the gains from the making of one study, the gains from a continuance of that study may be assumed to be greater. This statement holds whether consideration is being given to the effects on the producer or to the additions to general knowledge.

One who reads the literature of experimental and critical work on arithmetic and reading is impressed by the fragmentary nature of the studies, ending all too frequently with "tentative conclusions." The figures which have been presented in this article explain in large measure the circumstances which are responsible for this impression: the typical research worker attacks some isolated problem, finishes up his study quickly, suggests vaguely his intention of continuing the study at some unindicated time, drops the problem, and moves on to some other matter which momentarily engages his attention. It is by no means a healthy state of affairs when three-fourths of the writers on arithmetic and reading have produced but one investigation and when half of all the critical and quantitative writings on these subjects has been done by such individuals.

Gray, in his summaries up to 1929, reports a total of 70 "unpublished" masters' theses.[8] Of these 70, parts of only twelve later found their way into print. The other 58 masters' candidates apparently stopped their research with the completion of their theses. They not only did not publish reports of this work, but never again, so far as the records of publication show, did they make investigations worthy of being reported. One is impressed, too, as one leafs through the bibliographies, by the large number of individuals who collaborated with some one of the more productive workers in the making of some study, but who never again, on their own initiative, completed and reported studies. It would seem that these two classes of individuals (the degree candidates and the joint authors with more frequent contributors) should have had unusual opportunities and contacts through which to

[8] Institutions represented: Chicago, Hopkins, Indiana, Iowa, Minnesota, Peabody, Pittsburgh, and Southern California.

develop continuing interest in research. Their failure to do so testifies all too convincingly to the inadequacy of current methods of training in research.

Educational science, like other sciences, requires for its advancement something more than perfunctory efforts; it needs for its advancement workers who are not satisfied with sporadic attempts and half-answers; it needs investigators with a consuming curiosity, and an abiding and persistent urge. If educational science is to take the place for which it enters claim, it must concern itself with the *depth* as well as with the *extent* and *spread* of research interest.

PROBLEMS IN THE TRAINING OF RESEARCH WORKERS

HELEN M. WALKER
Teachers College, Columbia University

ORGANIZED research in the field of education is distinctly a modern phenomenon. Large scale research projects relating to the work of the schools carried out in America before 1900 could be counted on the fingers of one hand. In the last decade such projects have multiplied with a bewildering swiftness appropriate to our modern age.

Twenty years ago a genius here and there gathered about himself a handful of eager neophytes in whom he inspired a zeal for inquiry and to whom he gave unstinted guidance, individual, personal, and detailed. Less than ten years ago the appearance of the first books dealing with research methods in education testified to the increase in the number of persons devoting themselves to such work, and of the beginning of a shift from the apprentice system to the mass education of research workers. Today, courses in the methodology of research are multiplying rapidly in our schools of education and at the same time those classes already established have doubled and trebled their size. The most cursory examination of the catalog of any graduate teachers college gives evidence of the present emphasis on research in education. During the year 1931-32 the catalog of my own school (Teachers College, Columbia University) announced six one-semester courses and thirty two-semester courses on research in particular subjects, as well as twenty-five seminars attended by persons doing research for the doctorate. There were also six classes in statistical methods and about ten in tests and measurements. In addition, there was one master course in methods of research running for both semesters with an enrollment of over 100 during the term (spring of 1932).

In a study relating to certain aspects of the teaching of statistical method, Mr. Ralph Brown in 1932 wrote to 55 teachers of this subject in teachers colleges and schools of education, not including normal schools. The total enrollment reported by these teachers for the fall of 1931 was over three thousand, and one of the universities which did not reply was one in which the classes were unusually large.

In the January, 1932, number of the *Journal of Educational Research*, Dr. Good published a list of 476 pieces of research under way by candidates for the doctorate in schools of education. The actual number was considerably in excess of this figure, for studies which were still in progress but reported in the previous list (*Journal of Educational Re-*

search, January, 1931) were not included, and studies from the Universities of Chicago and Minnesota were not reported. The number of Doctors' theses under way in 1932-1933 is approximately eight hundred. Add to this total the vast number of smaller ventures used as subjects for Masters' essays, and the resultant picture of student activity in research constitutes a tremendous challenge to the resources and the planning of those who are responsible for the training of such research workers.

This phenomenally swift change from the days when research workers were chosen individually because of outstanding ability to organize experiments and to think in terms of mass data, and were trained by an expert who shared actively in a solution of their problems, to the present mass demand of large numbers of students for training in research techniques, is reminiscent of some of the difficulties through which the industrial world has passed on its way from the craftsman to the factory. In university circles the quality of Doctors' dissertations has become a by-word, a never failing source of conversation and execration when other topics fail. We observe in many of these dissertations the flimsy construction and absence of careful detail which differentiates ordinary furniture from that of Duncan Phyfe. We suspect that in a good many cases production has been for profit rather than for use. There is every reason to believe that the effects of mass production will grow more rather than less serious in the future. The time is ripe for those of us who are in some way responsible for the direction of research to take stock of the situation.

One of our problems centers around the word itself. No, the author does not mean its pronunciation, annoying as that is, but its popularity. The movement toward basing educational procedures on tested knowledge cannot be too strongly praised, and is one of the most genuine and noteworthy trends in modern education. Around the fringes of this movement, however, there hang many persons attracted by the glamour of the term "research," persons who want to feel that they are pushing back the bonds of ignorance, that they are making discoveries which will profoundly affect the course of education, but who have never had a truly original idea, and who imagine that from counting unimportant facts, or from putting trivial data through a statistical mold, there will eventuate significant findings, and that these findings will establish them as research workers. Their eagerness to place the tag of research on any small piece of work no matter if it be routine, trivial, and badly executed throws discredit on the large body of conscientious work which

is original, thorough, and useful. A mild deflation of the term "research" would be heartily welcome to most of us who are greatly concerned with an improvement in the output. Production for profit rather than for use has a tendency to reduce quality and to glut the market.

A second group of persons not always fitted by nature for research work, but forced to produce something which can pass by that name results from the impact of present economic conditions in education and the tradition that every Ph.D. shall have done a piece of research. The increasing demand that superintendents of school and teachers in colleges and normal schools shall hold Ph.D. degrees is not consistent with the tradition that a doctor of philosophy shall devote his life to the discovery of knowledge, and until this conflict is resolved we shall continue to blush for much of what our universities publish as "research in education." The presence of these two groups of students aggravates the difficulties of training research workers en masse. A reduction in the number of persons doing research for reasons other than sheer interest in the work would aid greatly in solving the problems discussed below.

It is very clear to me that teachers of research methods are no longer under any necessity of popularizing their field. The time has come when they may well assume the less gracious role of gad-fly, striving by every means in their power to create a mighty impatience with shabby work. It seems to me that they have a measure of responsibility for the general character of such studies even outside those conducted by their own students, and that a major obligation is on them to make it less easy for fallacious research to receive recognition. It is relatively easy to conduct a course in either research methods or statistical methods in such a way that students emerge from it with a confident faith in their ability to discover truth by routine processes, a zeal for applying their new techniques to the first data they can secure, and complete lack of any comprehension of the great variety of ways in which it is possible to reach results that delude rather than enlighten. In the long run such courses probably do more harm than good. Personally, the author does not believe in teaching, even in elementary classes, the application of a technique whose limitations cannot also be suggested.

An increase in the extent to which educators think in terms of mass data, a growth in the ability to reason statistically, is of enormous value. An increase in the number of persons who compute partial coefficients of correlation with but little idea of their meaning, may be considered of no

value at all. It may be a relatively easy task to induct an intelligent student into certain of the computational processes employed in research, to show him certain routines useful in experimentation and in the organization of mass data, but it is a much more difficult task to teach him to think straight, to know what assumptions are implicit in the formulas he employs, to know when those assumptions are inconsistent with the practical situation in which he is working, to draw only such conclusions as are logical, and to make only such generalizations as are justifiable. This difficulty is by no means lessened when such teaching must be conducted en masse and given to students who have carried over from their high-school days a dislike of numbers and an unpleasant emotional reaction to the use of algebraic symbolism.

The longer the writer teaches statistics and the more dissertations she attempts to direct, the more profoundly does she believe that the chief challenge to teachers of research methods is not to produce good computers and not to produce people who can juggle algebraic formulas or who can invent new terminology and new procedures, but to improve the quality of logic which goes into research. If this sounds both vague and Utopian let us examine certain particular points at which better logic is needed and try to ask what instructional problems are thereby raised.

In the first place, nearly all quantitative research involves generalizing, for a large population, results obtained from a sample. Logical errors in this process of passing from sample to population account for many of the contradictions when two investigations of the same subject lead to opposite conclusions. It is true that the avoidance of such errors calls for a combination of a high degree of logical acumen and a thorough knowledge of the content of the field of investigation. Nevertheless, students can be greatly helped by special exercises which relate to the criteria of random sampling and to the fallacy of shifting the universe of discourse, that is, of drawing a sample from one population and generalizing the results to apply to a different population. Often these errors are very subtle, and pointing out the general nature of such pitfalls is not enough. There are few published materials ready for class use, and there is a challenge to teachers to give more extensive consideration to this topic and to set themselves to devising more effective teaching materials. Personally, I consider it definitely harmful to teach the probable error formulas, especially the formula for the probable error of a difference, without devoting a rather long period, several weeks in my own classes, to developing the underlying concepts and assumptions.

A second way in which logical errors are made is in the use of statistical formulas in situations where their assumptions do not apply. It is obvious from reading a good deal of research literature that many people think of a formula as a Heaven-sent machine into which they can cram numerical data and from which truth will eventuate with little mental effort on their own part. Nothing could be farther from the truth. A formula is merely a sentence translated into algebraic shorthand, and is often the concluding sentence in a long argument—a statement of a relation which is true if all the previous assumptions may be granted. Often the simple formulas published in our elementary texts are only special cases of longer formulas, the short ones holding when the data conform to special conditions. The ordinary formulas for the probable error of a standard deviation and for the probable error of a coefficient of correlation are good illustrations. These are strictly applicable only when the distributions are neither too peaked nor too flat. Now the elementary texts in statistics and measurement almost never state these limiting assumptions, and in some cases such assumptions can be learned only by reading the original derivation of the formula. A paper read at the American Educational Research Association meeting last year illustrated this situation. A piece of research had been undertaken to check the Spearman-Brown Prophecy formula empirically. The work was carefully done in regard to all details but one, and that one wrecked the conclusions. The experimental conditions did not conform to the mathematical assumptions back of the formula, because the writer of this paper had not found those assumptions stated in the five or six elementary texts he had consulted.

Here there seem to be several implications for teaching.

(1) The first is an obligation upon teachers to know not only the formula, but also the limiting assumptions which condition its use. This is not as simple and easy of attainment as it sounds, because many of our better texts have neglected to give this information and we cannot expect all teachers of educational research to have the advanced mathematical training and the leisure necessary to read the original articles in which such formulas are derived.

(2) Consequently, it seems that a second implication is the need of texts which state explicitly all the assumptions back of every formula used, and which illustrate clearly the sort of typical errors which arise when these assumptions are not met.

(3) A third implication is a serious question as to the general philosophy of the teaching of statistical method. Should it be taught to all comers or only to those with a given minimum knowledge of mathematics? Can it be successfully taught to persons without a keen sense of logic? Is it desirable to teach people to make statistical computations without teaching them the much harder matter of statistical thinking? How much time is needed to achieve the latter? How much mathematics? How much attention to routine techniques? Are appreciation courses a good or a bad thing? On such questions there is room for legitimate diversity of opinion, and an open debate by persons who have real convictions would be stimulating.

In the third place there is a tendency for amateur workers to think in terms of techniques learned rather than in terms of problems to be solved. When a beginner is faced with a research problem it is a perfectly natural thing for him to ask himself, "Which of the techniques that I have learned is applicable here? What computations have I learned to make which I can use with these data?" This is, of course, all wrong, and is probably the reason for much superficial work. The important question is not, "What do I know how to do," but "What questions would I like to have these data provide the answers for," "Have I learned any techniques which might be useful in getting these answers? If not, can some expert suggest to me sources for finding such techniques?" It is vastly easier to devise teaching materials which will tend to evoke the first response rather than the second, and our current texts give us more help with it. That difficulty, however, can be surmounted by ingenuity. A greater difficulty is the fact that no class in the course of a single year can possibly study all the statistical techniques which might be called for in any given study unless they learn merely the routine and not the underlying logic. The author's own way of dealing with this is deliberately to foster a sense of incompleteness, to open doors into passages down which she invites her classes to look but not to travel, to tell them "If you ever have a problem dealing with thus and so, you will want to look up such and such a topic, and here are references which may be helpful." This is vastly annoying to the type of student who prefers to feel a sense of completeness and mastery even at the expense of being uninformed. It is not a popular method, but it is honest and, in general, conducive to better research.

Last of all there is a great dearth of educational philosophers who understand the methods of statistical inference sufficiently well to make

intelligent use of results of mass studies as the foundation for an emerging philosophy of education. A great deal of superficial criticism has been leveled at objective research, much it well deserved, but some of it more eloquent than informed. We need more great minds who are both philosophers and statisticians, persons who can think creatively in terms of social welfare and who are at the same time well versed in research methods even if they do not actively engage in objective research. All of us could name a few living men who are great in both respects, but we need many, many more. At present there are hundreds of small uncoördinated pieces of research which are almost a total waste because no one gathers them into meaningful wholes. The best piece of objective research may fail to be translated into administrative procedure. A statistical study may be admirable in execution yet the laymen who try to make use of its findings may read into it such unwarranted generalizations that its import is completely misunderstood. The expert statistical worker may fail to do useful work because his careful data relate to trivial matters. All in all, there is far too often an unfortunate hiatus between objective research and the philosophy and practice of educators. The point of contact between these two modes of thought seems to me more in fault than either mode of itself. Teachers of research methods need to torment their classes constantly with consideration of possible fallacies in logic. On the other hand, the author thinks we well may ask that the educational philosopher of the future have enough training in statistical methods to be able to criticize them intelligently and to interpret their results accurately.

EQUALIZATION OF THE BURDEN OF CAPITAL OUTLAY IN A STATE'S MINIMUM EDUCATIONAL PROGRAM

F. E. GROSSNICKLE
State Normal School
Jersey City, New Jersey

THE principle of state responsibility for providing educational opportunities for its citizens is universal in the United States. The degree to which the state should participate in the "equalization of educational opportunity" and in the "equalization of school support" is still a matter of experiment. The problem of equalization of educational opportunity and burden is defined in the Educational Finance Inquiry as follows:

"To carry into effect the principle of equalization of educational opportunity and equalization of school support as commonly understood it would be necessary (1) to establish schools or make other arrangements sufficient to furnish the children in every locality within the state with equal educational opportunities up to some prescribed minimum; (2) to raise the funds necessary for this purpose by local or state taxation adjusted in such manner as to bear upon the people in all localities at the same rate in relation to their tax-paying ability; and (3) to provide adequately either for the supervision and control of all the schools, or for their direct administration, by a state department of education."[1]

The proposal defined by the Educational Finance Inquiry calls for "equality of opportunity for all" and "equality of the burden of taxation." Since these principles were defined, many techniques have been devised for carrying out the proposals for equalization. The pioneer study in this field was made by Mort.[2] He showed how it is possible for a state to equalize the burden for current expense. Later studies by Burns and Johns[3] enable a state to equalize the burden for transporting pupils. A third study, made by Harry,[4] took into consideration living

[1] Strayer, G. D., and Haig, R. M. *The Financing of Education in the State of New York* (New York: Macmillan Company, 1923), p. 174.

[2] Mort, P. R. *The Measurement of Educational Need*, Contributions to Education, No. 150. New York: Bureau of Publications, Teachers College, Columbia University, 1924.

[3] Burns, R. L. *Measurement of the Need for Transporting Pupils*, Contributions to Education, No. 289. New York: Bureau of Publications, Teachers College, Columbia University, 1927.

Johns, R. L. *State and Local Administration of School Transportation*, Contributions to Education, No. 330. New York: Bureau of Publications, Teachers College, Columbia University, 1928.

[4] Harry, David P., Jr. *The Cost of Living of Teachers in New York State*, Contributions to Education, No. 320. New York: Bureau of Publications, Teachers College, Columbia University, 1929.

costs within different parts of a state and showed how these factors could be expressed in terms of the minimum program. Thus, means are provided for equalizing the cost of the minimum current program in a state even when this minimum program is affected by such factors as transportation costs and inequality in living costs. Although the technique proposed by Mort applies to equalizing the total cost of the minimum program or to the cost of the minimum current expense alone, he suggests that a different equalization program should be developed for capital outlay.[5] To have complete equalization of the burden of cost it is necessary to index the factor of capital outlay in relation to a minimum program. A technique to be used for this purpose is supplied by the writer.[6] In the latter study it is not shown that a state should or should not provide a minimum capital outlay program. If a state wishes, however, to guarantee an educational program of this type, the technical means are proposed for the inclusion of capital outlay in a minimum program.

At present no state-wide plan of equalization for capital outlay costs is in operation although various proposals have been made for this purpose.[7] In all of the different plans proposed, no adequate measure is supplied for determining the need of the minimum program except in the plan offered by Mort. The starting point of the study by the writer was the determination of the validity of an assumption by Mort. Mort assumed that there is a linear relationship between the cost of the minimum program for current expense and the cost of the minimum program for capital outlay.[8] *A minimum capital outlay is defined as one which is necessary for the operation and functioning of a minimum current program.* If there is a linear relationship between these two variables as Mort assumed, then the technical phase of equalization is easily solved. In its final analysis, this is a mere bookkeeping job as he predicted.

The capital costs for the districts used in this study were financed by bond issues. Since a bond issue extends over a period of years, it was necessary to express the yearly burden of the capital cost in some

[5] Mort, P. R. *State Support for Public Schools* (New York: Bureau of Publications, Teachers College, Columbia University, 1926,) p. 87.

[6] Grossnickle, F. E. *Capital Outlay in Relation to a State's Minimum Program.* Contributions to Education, No. 464. New York: Bureau of Publications, Teachers College, Columbia University, 1931.

[7] Grossnickle, F. E. *op. cit.*, p. 5.

[8] Mort, P. R. *op. cit.*, p. 87.

index. Debt service was used to give an index of the yearly cost for capital charges. Debt service represents the amount of money spent annually for liquidating outstanding indebtedness or for interest charges caused by this indebtedness. A valid measure of the burden of capital outlay will be given by debt service in a state in which all school bonds are serial, or in which term bonds are issued if certain statutory limitations are defined concerning the administration of adequate sinking funds for the amortization of outstanding term bonds. In either case it must be illegal to refund bonds at the time of their maturity. New Jersey is one of the few states in which it is illegal to issue term bonds for municipal purposes. Likewise, it is illegal to refund municipal bonds when they mature. In this state, limits are set by law defining the conditions under which the serial bonds are to be amortized. Hence, in New Jersey debt service may be used to represent the annual burden for the cost of capital outlay. The data used by the writer were secured for the school districts of this state.

To make a complete study of building costs in a state, it would be necessary to trace a whole building cycle. Strayer and Haig[9] found this to be a period of about 75 years in New York State. A building cycle represents the interval of time between the erection of a building and its replacement by another building. To study a period of such duration is not feasible due to the inadequacy of records. A ten-year period, 1919-1928, was chosen as representative of a whole cycle because it was the year preceding the beginning of this decade that the statutory limitations concerning the issuance and redemption of bonds were put in operation. If evidence is desired to show that this period is typical of a building cycle, the reader is referred to the monograph by the writer.

The purpose of this study was to show the relation between current expense and debt service, the latter as a measure of the burden of capital outlay. For each school district studied, the costs of these two variables were divided by the number of teachers in that district. That gave a "teacher-unit" cost for both of these quantities. A more exact unit would have been "typical teachers" or "weighted pupils" as defined by Mort,[10] but it was not necessary to use this refined unit because Mort assumed that there would be a linear relationship between current and

[9] Strayer, G. D., and Haig, R. M. *op. cit.*, p. 82.

[10] Mort, P. R. *The Measurement of Educational Need*, Contributions to Education, No. 150. New York: Bureau of Publications, Teachers College, Columbia University, 1924.

capital costs regardless of the type of educational program offered by the districts of a state. If this hypothesis is true, it is not necessary to express the costs in units of "typical teachers" or "weighted pupils," because the same relationship would exist in a study of the costs for current practices as in a study of the costs for minimal programs. Since actual practices were investigated, a very convenient unit for expressing costs would be teacher-units.

The total current expense and the total debt service of each district studied for the ten-year period from 1919-1928 was divided by the total number of teachers in that district for that same interval. This gave the average cost per teacher for current expense and debt service for that decade. The range per teacher for current expense was from $1400 to $4500; for debt service, from $0 to $1350. There were 416 different districts included in the study.

FITTING A CURVE TO THE DATA

The debt service and current expense per teacher for each of the 416 districts studied are given in Figure I.

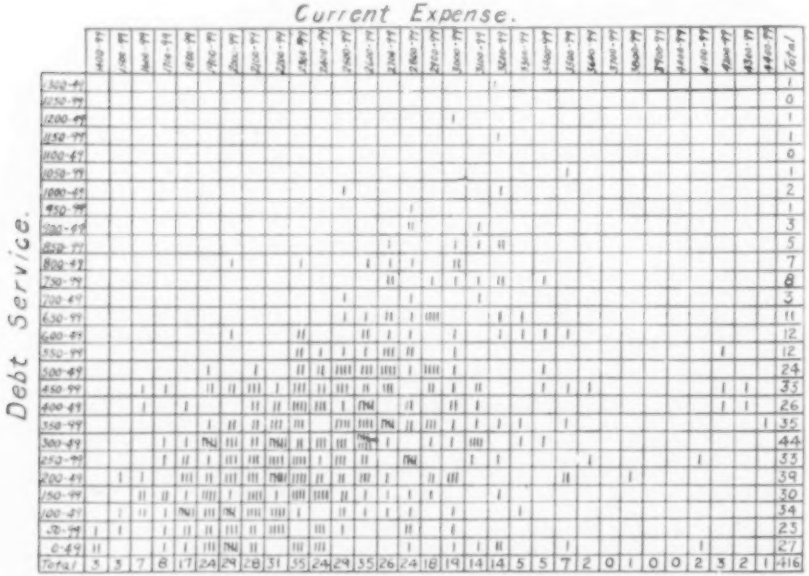

FIGURE I. SCATTER DIAGRAM OF DEBT SERVICE AND CURRENT EXPENSE FOR 416 SCHOOL DISTRICTS IN NEW JERSEY

Using the distribution given in Figure I, a straight line was fitted and the data were tested for linearity. The goodness of fit can be seen graphically from Figure II in which the dots represent the means of the columns. When Blakeman's test is applied, it is found that zeta is 4.84 times its probable error. Hence, the entire distribution cannot be considered linear as Mort assumed. It will be observed, however, that the distribution is sensible linear up to about $3000 current expense.

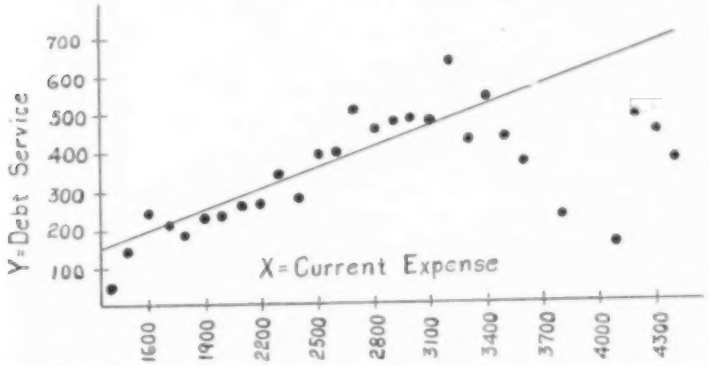

FIGURE II. A STRAIGHT LINE FITTED TO THE DISTRIBUTION IN FIGURE I.

$$\tilde{Y} = 0.1819X - 106.77$$
$$\eta = .524$$
$$r = .416$$

Since Blakeman's test showed that the distribution is not linear, a curve of some type will give a better fit than a straight line. After experimenting with an unweighted and a weighted hyperbola, a logarithmic growth function, and an unweighted and a weighted cubic, the latter was taken as the type of curve which will give the best fit to the data of any of the curves tried. The equation for the weighted cubic is, $\tilde{Y} = 460.55 + 22.058X - 1.0777X^2 - 0.080326X^3$, in which $\tilde{Y}$ is the predicted debt service per teacher and X represents the value of the current expense expressed in numerical units on the X-axis. The zero value of X represents a current expense of $2950. For each plus or minus unit on the X-axis from this point, there is a corresponding increase or decrease of $100 in the current expense represented by this value. The story is told graphically with Figure III.

From an inspection of Figure II, it is seen that a straight line relationship exists between debt service and current expense until the latter

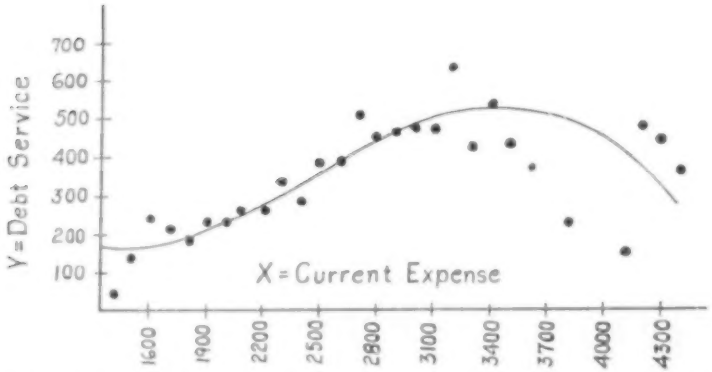

FIGURE III. A WEIGHTED CUBIC FITTED TO THE DISTRIBUTION IN FIGURE I.

$$\tilde{Y} = 460.55 + 22.058X - 1.0777X^2 - 0.080326X^3$$

reaches a level of about $3000 per teacher. To see if a better fit could be obtained than that given by weighted cubic, the table of data was divided into two parts and a straight line was fitted to each part. The first part of the table included those districts which had a current expense per teacher between $1400 and $3099; the second part, those districts which had a current expense per teacher from $3100 to $4499. The two regression lines are given in Figure IV.

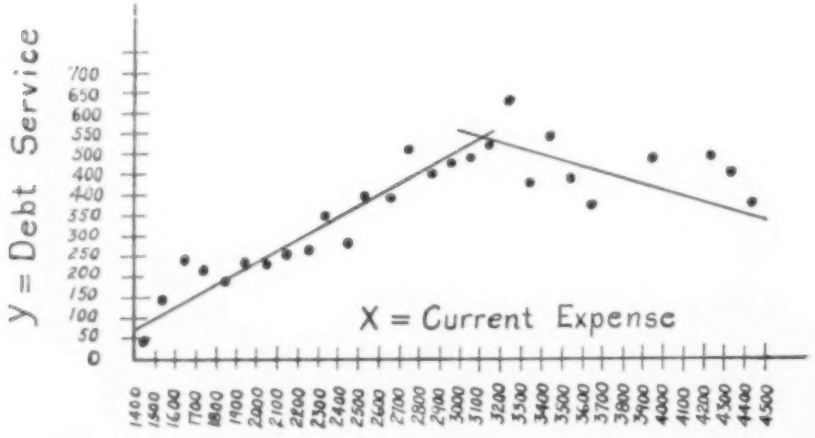

FIGURE IV. TWO REGRESSION LINES FITTED TO THE DISTRIBUTION IN FIGURE I.

$$\tilde{Y} = 0.2616X - 292.50 \qquad \text{and} \quad \tilde{Y} = 0.1539X + 1024.65$$

The criterion for goodness of fit for least squares curves is having the sum of the squares of the deviations of the predicted values from the actual values a minimum. For the regression value in Figure II, the sigma of the deviations is found by using the formula,[11]

$$\sigma_y^2(\eta_{yx}^2 - r^2) = \sigma_d^2$$

Substituting in the formula, the sigma squared of the deviations for the regression line is 5411.4. The sigma squared of the deviations for the cubic in Figure III is 3004.2. For the two regression lines in Figure IV, the sigma squared of the deviations is 2322.6. Thus, it is seen that for one curve fitted for the whole distribution, the weighted cubic gives the best fit. However, when the distribution is divided into two parts and a straight line is fitted to each part, a better fit can be obtained than that produced by one curve.

From Figure IV it is seen that a linear relationship exists between debt service and current expense until the level of the latter reaches approximately $3000 per teacher. This means that as the level of the minimum current program increases from $1400 to $3000 per teacher there will be a linear relationship between these two variables. After the cost for the minimum current program has been determined, the provision for a minimum capital outlay program is a mere bookkeeping job as long as the minimum current program does not exceed $3000 per teacher. For all practical purposes, this will provide a technique for equalization for capital outlay for many years hence, because no state at present maintains a minimum current program in excess of $1500 per teacher. Therefore, Mort's assumption is correct until the level of the minimum current program exceeds $3000 per teacher.

Summary

This study attempted to find a technique which would enable a state to provide an equalization program for capital outlay, if the latter is considered expedient. Debt service was taken as an index of the burden for capital outlay. The starting point of the investigation was an assertation by Mort that there is a linear relationship between current expense and capital outlay, the latter being represented by debt service. The costs of current expense and debt service for 416 school districts in New Jersey were studied for a ten-year period, 1919-1928. The costs of both of these

[11] Holzinger, Karl J. *Statistical Methods for Students in Education* (Boston: Ginn and Company, 1928), p. 179.

services were expressed in teacher-units. An equation was then derived to express the relationship between these two variables. A weighted cubic gave the best fit possible when the whole table was considered. Using only those districts which did not have a current expense exceeding $3000 per teacher, a straight line regression gave the best fit. This means that until the level of the minimum current program is not in excess of $3000 per teacher, a linear relationship exists between these two variables. Hence, when the cost of the minimum current program has been established, the amount to be provided for a minimum capital program is readily found by taking a determined percentage of the cost of the minimum current program.

EDITORIALS

CRITICAL STUDY WITH A MINIMUM OF RESEARCH

ACCURATE information is not available for indicating the extent to which educational research activities of colleges, universities, state departments of education, and public schools have been curtailed as a result of the present financial crisis. However, numerous statements from representatives of these organizations indicate forced suspension of activities usually designated as educational research. Investigations, reported in large numbers in educational periodicals, bulletins, and monographs, are of such nature that their prosecution entails sizeable expenditures of money and the services of a corps of specialists and clerical assistants. Sometimes this corps of workers functions as a special department devoting the greater part of its time to research. More often the director of a research project is charged with other duties of administrative, supervisory, or instructional nature. Especially is the last statement true of the college or university teacher who directs special studies in education. It is a matter of some moment to re-direct efforts that have been spent in research when the researcher suddenly finds that funds for subsidizing his work are denied him.

It has occurred to numbers of persons caught up in a series of circumstances like those mentioned above that there exists a large body of educational fact for which very inadequate interpretations exist.

With these reports available along with a large number of reports of critical studies, most anyone who can no longer do research in the generally accepted sense may, if he chooses, profitably devote a considerable portion of his time to evaluation and interpretation of educational data already existent. There is, moreover, a startling need for recasting much of our thinking about educational problems that do not lend themselves to quantitative treatment. This ability (not the capacity) for thinking through the problems involved in deciding on the extent to which the state should provide, and the manner in which the state should support an educational program is an ability that many clever researchers do not possess and will not possess until they have learned a great deal about matters of which they are not well informed at present. In other words, some intensive critical study at the present time with a moratorium on the research activities of a considerable number of educators may promise more for education than the continued feverish effort to gather more data of a quantitative nature.

CHARLES W. KNUDSEN

REVIEWS

Address all communications relative to book reviews to Editor
E. J. Ashbaugh, Miami University, Oxford, Ohio.

BROWN, H. EMMETT, AND BIRD, JOY. *Motion Pictures and Lantern Slides for Elementary Visual Education.* New York: Bureau of Publications, Teachers College, Columbia University, Lincoln School Research Studies, 1931. vii + 105 pp.

As the demand for visual aids grows there is also an increasing need for supplying teachers with carefully annotated lists of the sources of visual aid materials. The Lincoln School of Teachers College has recently published as one of its research studies, a monograph which lists the motion pictures, film strips, and lantern slides available for visual instruction in the elementary school field.

The first fourteen pages of the monograph discuss visual instruction, its characteristics and materials. This is followed by a bibliography on the use of lantern slides and motion pictures, and on the making of films and lantern slides.

The second part of the monograph is seventy-eight pages in length. This section, which is the body of the monograph, contains an annotated list of motion pictures, lantern slides, and film strips to be used in teaching civics, elementary science, geography, nature study, physical education, and nursery stories. The following excerpts taken from page thirty-six show the type of annotation one will find:

From the Woods to the Mill. San Leandro, Cal. Caterpillar Tractor Co. Free.

Logging operations as carried on at the Red River Lumber Co., Westwood, Cal.

A somewhat similar picture from the same company is *Logging* which is also free.

Lumbering in the Pacific Northwest. Eastman. For sale only, $35.

A film which presents the complete story from the laying of the railroad preliminary to the logging operations to the final preparation of lumber for market. A teacher's manual accompanies this film.

The Trail of the Long Leaf Pine. Western Electric. For sale only, approximately $30.

Splendid scenes of these forest kings as they totter and fall. Views of the lumber camps with men at work and play.

May be borrowed in 35 mm. width from same source or from New York Telephone.

(Note: These are classified under: Geography, I. Commerce and Industry, A. Lumbering and Derived Products)

An appendix listing the sources of motion pictures, lantern slides, and strip films and projection equipment concludes the monograph. It has an index which adds greatly to its usefulness.

Elementary school teachers should find this monograph to be of service. While the authors state (p. iii) that "the presentation of a compendium of this kind is not without its dangers . . . constructive and intelligent demands for better educational films cannot be expected until teachers are more familiar with the visual material already on the

market. To give teachers an opportunity to become familiar with this material and to make it easily available for use is the purpose of this booklet."

F. DEAN MCCLUSKY
Scarborough School,
Scarborough-on-Hudson, New York

HOLMSTEDT, R. W. *A Study of the Effects of the Teacher Tenure Law in New Jersey.* New York: Teachers College, Columbia University, 1932. ix + 111 pp.

The title of this study indicates the purpose in making it. The method of appraisal was a comparison of the stability of the teaching personnel in New Jersey and Connecticut. The latter state was chosen because no statewide tenure law has been enacted there. Moreover, the two states compare favorably in educational standards. And in addition the social and economic conditions in the states are similar.

Data respecting the operation of tenure policies in the two states were obtained from questionnaires to superintendents, teachers, and members of boards of education. Data from these sources were supplemented by personal visits to school systems and state departments and a review of judicial decisions on tenure in New Jersey.

After the available evidence was examined the author found:

1. The stability of the teaching personnel in the two states is not significantly different.
2. Once on tenure teachers have been so secure that the incompetent are removed only after serious difficulty.
3. The law in New Jersey was established only after a long struggle. Numerous attempts have been made to repeal it. Even today after twenty years of experience with it, the majority of boards of education are opposed to the law.
4. On the whole, teachers in New Jersey give ample evidence of professional progress.

From the above facts the author concludes:

1. Such differences in tenure as exist in favor of New Jersey are probably because of other factors such as high salaries, careful supervision and a definite state organization.
2. The law works a hardship on beginning teachers. The probationary period of the law needs revision.
3. The benefits of tenure may be secured in any state if annual contracts were eliminated and a direct method of dismissing incompetents could be devised.

The monograph is well written and so well organized that the substance of it may be readily gained in a single setting. The author is to be commended for care in gathering the data and his caution in deductions from the evidence. The reader is left with the notion that the tenure law in New Jersey is either unsatisfactory or the conditions for its successful operation are inadequately developed.

In the opinion of the writer the latter point is very well taken. Here, as elsewhere, educational progress has been hindered by its ardent supporters. They rush into legislative enactments only to realize later that the plant of their solicitous care is without soil in which to flourish.

The use of the word "law" in the title suggests a legal treatment of tenure. For such a consideration the reader must look elsewhere. Only a brief chapter is devoted to the legal experience. The tenure law itself is omitted. The study is neither exhaustive nor thoroughly treated. The reader should be charitable, however, on these points. It is well that someone

had the initiative and perseverence to gather and evaluate evidence which in New Jersey has been accumulating since 1909.

S. B. DAVIS
University of Pittsburgh

MALIN, J. E. *Construction of a Diagnostic Test in the Mechanics and Related Fundamentals of High School Chemistry.* Philadelphia: University of Pennsylvania, 1932. 261 pp.

As we have learned more and more about test construction and the need for determining reliability and validity before passing a test on to the unwary public, the number of new tests has decidedly decreased. The need, however, for adequate survey and diagnostic tests in the fundamental high-school subjects has by no means been fully met, and this extensive study, which was finally submitted in partial fulfillment of the requirements for a doctor's degree, adds distinctly to the list of tests in the field. The tests are easy to administer and should aid the teachers greatly in determining further teaching needs of individual pupils.

CRAWFORD, A. B. *A Critical Analysis of the Present Status and Significant Trends of State Education Associations of the United States.* Bulletin of the Bureau of School Service, Lexington, Kentucky: College of Education, University of Kentucky, 1932. 155 pp.

It is sometimes worthwhile to look backward to the beginning of some of the things which are so common as to be generally accepted. Such is true regarding state education associations in the United States which now exist in all forty-eight states, thirty-four of which have full time secretaries. So far as the United States is concerned, this movement seemed to have started in the American Institution of Instruction, founded in 1830. Mr. Crawford has brought together in very readable form the high points in the history of this movement of volunteer teacher organizations, together with the present status and objectives.

KUNZIG, R. W. *Public School Education of Atypical Children.* Bulletin published by United States Department of the Interior, Washington, D. C., 1931. 160 pp.

School people and social workers are quite as cognizant of the need of special attention being given to atypical children in periods of depression as in periods of economic prosperity. Consequently, the recent United States bulletin dealing with this topic will be of much interest to school people because it makes available state laws, state organizations and administrations throughout the country, and the particular provisions made in cities of over one hundred thousand population.

While in many cases, reduced school funds will make it impossible for the cities to carry on the programs reported in the bulletin and likewise impossible for other communities to provide such opportunities, nevertheless school administrators will read with a great deal of interest the material contained in the bulletin and will doubtless make tentative plans for similar developments in their own schools when enlarged finances make such possible.

CRUMP, B. L. *The Educability of Indian Children in Reservation Schools.* Southeastern State Teachers College Contributions to Education, No. 3. Durant, Oklahoma: Southeastern State Teachers College, 1932. 58 pp.

Those who live in cities or states of closely homogeneous population frequently fail to be cognizant of the sig-

nificant educational problems which exist in communities and commonwealths with large groups of unassimilated population. One of the problems which has attracted the attention of students in the South and West has been that of the education of Negroes and Indians. Early efforts at determining racial differences worked with reaction time, memory, and relative sensibility of the sense organs. With the advent of intelligence tests a new instrument became available.

The present monograph deals with fifty full blood Indian children from each of five civilized tribes of Oklahoma who are now in Indian schools. Individual examinations with Stanford revision of the Binet-Simon, the Pintner-Patterson performance, and the Goodenough intelligence test, gave apparently valid data on intelligence quotients. Significant general conclusions reported were that the average I.Q. was lower than for white children though the range was exceedingly great. There seemed to be significant differences between the different tribal groups but these differences were not constant for the three types of tests used. Opportunity classes and more flexible curricula are recommended.

ECKELBERRY, R. H. *The History of the Municipal University in the United States.* Bulletin of the United States Department of the Interior, Office of Education, Washington, D. C., 1932. 213 pp.

The United States Office of Education, under the leadership of Dr. Cooper, has been tremendously interested in the history of education in the United States. It has definitely encouraged graduate schools to seek competent students who could write up the history of education in their own states; also the history of wide spread educational movements which pertained to the country as a whole rather than to single states. It is further encouraging this movement by printing some of these histories, and it had laid out an extensive program for further printing when the economy movement in Congress reduced the appropriations to a point where it was no longer feasible. Among the bulletins, however, which came through under this program, is this history of the Municipal University which has been playing such a large part during the last few decades.

Dr. Eckelberry found eleven institutions in the United States eligible under this title. They range in date of founding from the College of Charleston, first opened in 1790 and first under municipal control in 1837, to Brooklyn College in New York City, opened in 1930, and the Municipal University of Omaha, which though opened in 1909, first came under municipal control in 1931.

Each of the eleven institutions treated separately, includes a general survey of the conditions that have led to the development of municipal universities and their characteristic features. The author is optimistic concerning the future. As long as local pride exists, in times of prosperity at least, the larger municipalities are quite likely to be ambitious and expend part of their energy in this direction.

GAUMNITZ, W. H. *Status of Teachers and Principals Employed in the Rural Schools of the United States.* Bulletin published by the United States Department of the Interior, Washington, D. C., 1932. 122 pp.

Although the urbanization of the United States has gone on steadily for several decades, and centralization or consolidation of schools has eased the rural education problem, in a large num-

ber of communities there still remains a definite rural school problem. Dr. Gaumnitz has made this problem clear in his presentation of salary status, length of term, educational status and experience of those employed in rural school work.

He states in his conclusion that there are apparently 217,000 schools located in rural communities under the administrative control of county or other superintendents; that these schools enroll nearly 11,000,000 children and employ 400,000 teachers and about 15,000 principals. About forty percent of these rural teachers are employed in one-room schools. Needless to say, the situation regarding Negro schools and teachers is very much worse than the corresponding situation for the whites.

ELLIS, W. C. *Salary and Cost Study of Fresno Schools.* Bulletin published by Fresno City Council of Education, Fresno, California, 1932. 190 pp.

California, which has often been pointed out to the rest of the United States as the land of superlatives, seems also to have been hit by the depression. A citizen's committee of Fresno, at the request of the county chamber of commerce, has made a study of salaries and costs in the Fresno schools. This study, with that of Cleveland (reviewed in a recent number of the Journal) will give the student of present day school finances much help in the relation of the various expenditures to the problem, the technique of analyzing the ability to support education, and will doubtless enable superintendents in small places to make somewhat comparable studies of their own situations.

Sixteen indices of the city's financial ability were selected, namely, assessed valuation and true valuation, tax rates total and school, delinquent taxes, mortgages, trusts, debts, and foreclosures, bankruptcies, bonded indebtedness, value of school property, building permits, employment, manufacturing, retail business, bank clearings, bank debits, postal receipts, telephone, and miscellaneous expenses.

A summarization of the data showed Fresno at least average, or perhaps somewhat above comparable California cities in its ability to support education. The real basis for the difficulty in Fresno, in California, and in the whole United States, is that practically without exception real property is carrying much more than its due share of the tax burden for government.

LOCKHEAD, JEWELL. *The Education of Young Children in England.* New York: Bureau of Publications, Teachers College, Columbia University, 1932. vi + 226 pp.

The rapidly growing interest in "preschool" education in this and other countries makes this a very timely book. Moreover, the fact that England has done so much more than other countries to provide for the training of young children in its public elementary school system, and the further fact that in the infants', kindergarten, and nursery schools that country presents three fairly distinct methods of attacking the problem, makes the author's choice of field an especially happy one.

Chapter I is devoted to a brief but satisfactory survey of the general educational system of England, and Chapter II to a discussion of the contributions of Owen, Wilderspin, Pestalozzi, Froebel, and Montessori to the theory and practice of teaching young children. Then comes the body of the work, where the author deals with the aims, educational theory, scope and function, or-

ganization, curricula, methods, buildings and equipment, etc. of the infants' schools, kindergartens, and nursery schools as now conducted in England. To this is added a chapter on the training of teachers for these schools. The principal source of data was personal observation during 1928-29 of the work of 253 teachers in fifty-four schools. This data has been supplemented by wide reading, and interpreted in the light of broad knowledge of educational conditions.

The author is not satisfied merely to describe conditions, but critically evaluates them from her own Deweyan point of view, and compares them with conditions in the United States. She finds many interesting points of comparison between the two countries, and shows that each may learn much from the other in this highly important field. She has produced a work of real value to students of the education of young children and of comparative education.

R. H. ECKELBERRY
Ohio State University

WOOD, BEN D., AND FREEMAN, FRANK N. *An Experimental Study of the Educational Influences of the Typewriter in the Elementary School Classroom.* HAEFNER, RALPH. *The Typewriter in the Primary and Intermediate Grades.* New York: Macmillan Company, 1932. ix + 214 pp. and xiv + 342 pp.

These companion books constitute a two-volume report on the Elementary School Typewriter Investigation which was conducted during 1929-31. The section by Wood and Freeman is the technical volume consisting mainly of a detailed description of the experimental procedure, while the section by Haefner is the pedagogical volume making use of the data assembled in the technical treatise and organizing it for the teacher who will need specific suggestions regarding the use of the typewriter in the elementary classroom. The Typewriter Educational Research Bureau obtained the subventions making possible this investigation carried on with absolute integrity to scientific procedure.

Dr. Wood and Dr. Freeman devote the first chapter of their volume to a presentation of the purpose and plan. Emphasis is placed upon the main purpose as being concerned with "the nature and extent of the educational influences of the portable typewriter when used as a part of the regular classroom equipment in the kindergarten and elementary grades," and not with "typewriting as an end in itself." The second and coördinate purpose is concerned with a study of "the typewriter as a classroom instrumentality." The typewriter group was made up of 6125 pupils in 27 schools, with 180 teachers; the control group totaled 8842 children in 24 schools, with 239 teachers. The machines used by pupils numbered 1839, those used by teachers, 154. Subsequent chapters deal with the results of achievement tests at the end of the first and second years, children's writings during each of these years, teachers' judgments on the influences of the typewriter, teachers' observations on the teaching and management problems of the classroom typewriter, children's attitudes toward it, and experiences of individual schools.

The eleventh chapter presents the summary thoroughly substantiated by the evidence presented. The evidence is in favor of the typewriter group as making the greater educational gains as measured by the Gates Reading Test and the Stanford Achievement Test. "Considering the probable errors, the most significant differences in gains in favor of the experimental groups were in the fol-

lowing sub-tests, in order: spelling, arithmetic computation, geography, word meaning, language usage, and paragraph meaning." The authors conclude that "the typewriter can be used advantageously in most, if not all, of the subjects of instruction in the elementary school," and that "the typewriter's influence on spelling is more favorable than on any other subject tested in the Stanford Achievement Test." Skill gained in the use of the typewriter "was not made at the expense of skill in handwriting." The influence of the typewriter upon the increased quantity of original written material is especially significant, particularly in the lower grades where "the disadvantages and limitations of handwriting as a means of written expression have been most often observed."

Dr. Haefner's treatise is divided into five main parts, the first of which gives the background for the educational use of the typewriter. Since this book is intended to serve as a guide to teachers, Part II presents the teaching of the use of the typewriter at each grade level, and the valuable suggestions offered in Part III are organized by subjects, with subdivisions by grades. Part IV deals with administrative problems involved, and Part V with the attitude of children and teachers toward the use of the typewriter. The book contains facsimiles of typing done by pupils in practically all subjects, and from the kindergarten through the sixth grade. Together, these volumes present a significant contribution to elementary materials and technique.

MYRTLE L. KAUFMANN
State Teachers College,
Fredericksburg, Virginia

RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to Editor A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

CASWELL, HOLLIS L. *Program Making in Small Elementary Schools*, Field Studies No. 1 (Revised Edition), Division of Surveys and Field Studies (Nashville, Tennessee: George Peabody College, 1932), 76 pp.

This bulletin contains a statement of the problem, the qualities of a good program, standards of time allotment, classes by grades or combinations of grades, distribution of instruction time to classes in small schools, the daily program, and the study program. Bibliography.

CHEYDLEUR, FREDERIC D. *Mortality of Modern Language Students: Its Causes and Prevention*, Reprint from *The Modern Language Journal*, XVII (November, 1932), 32 pp.

In this investigation the author presents a clinical study of the causes of scholarship mortality in modern languages and its prevention. On the basis of his findings the author recommends the use of intelligence, placement, and achievement tests, personal guidance, grouping into upper and lower sections, the employment of a method with available objectives, small beginning classes and larger succeeding ones, and the sifting, winnowing, and rewarding of teachers.

COON, BEULAH I., AND OTHERS. *Suggestions for Studies and Research in Home-Economics Education: Outline of Projects Needing Investigation and Some Basic Considerations in Relation to Them*, Bulletin No. 166 (Washington: Federal Board for Vocational Education, 1932), xi + 77 pp.

Contains a discussion of the possibilities of research in home-economics education, factors to consider in home-economics education, responsibility of institutions giving training for research, the procedure in conducting studies, and a partial outline of the fields of investigation and research in home-economics education: curriculum, methods of instruction, measurement, administration, and education of leaders and supervision. Bibliography.

CUNNINGHAM, K. S., AND OTHERS. *Australian Educational Studies*, Educational Research Series, No. 14 (Melbourne, Australia: Melbourne University Press, 1932), 125 pp.

This bulletin contains papers on the length of teachers' professional life, an experiment in the teaching of reading comprehension, standardized tests of teaching ability, problem children in Melbourne schools, crippled children in Tasmania, and the story of an Australian nursery school.

DAVID, FLAVIUS LOUIS. *The Selection and Organization of Personnel for Curriculum Revision*, Curriculum Laboratory, School of Education (Cleveland, Ohio:

Western Reserve University, 1932), 55 pp.

This bulletin contains a statement of the problem, sources of data, breaking ground for the revisions, production of the revised curriculum, curriculum committees, school officers and their activities, and recommendations. Bibliography.

HOLY, T. C., AND OTHERS. "School Buildings, Grounds, Equipment, Apparatus, and Supplies," *Review of Educational Research*, II (December, 1932), 98 pp.

This bulletin contains a summary of researches relating to the school building program, the school site, school buildings, equipment and apparatus, and school supplies. Bibliography.

LEONARD, STERLING A. *Current English Usage*, English Monographs No. 1, The National Council of Teachers of English (Chicago: The Inland Press, 1932), xxii + 232 pp.

This bulletin contains a report of two researches, the first relating to current usage in punctuation, and the second relating to current usage in grammar. The study aims to do three things: (1) to show the trend of current usage and whether it coincides with the rules taught in our schools; (2) to bring to light diversities in usage, so that something may, if possible, be done to control it; and (3) to point out some of the general criteria referred to by the judges in making their decisions. The bulletin presents an assemblage of usage based upon a statistical analysis of the replies of competent judges.

Nineteenth Annual Conference on Educational Measurements, Bulletin of the School of Education (Bloomington, Indiana: Indiana University, 1932), 139 pp.

This bulletin contains discussions of the following topics: a study of individual differences of scores made in similar learning tests; some failures and achievements in the broader aspects of measurement; a summary of studies in leadership; elementary education in new Austria; some remarks on teacher training in Europe; experimental and critical appraisals of certain progressive methods; why college teachers fail; child accounting in Indiana; improved methods suggested by recent research; newer methods and the general objectives of education; objective measurements in physical education; primary children's comprehension of a social situation; and recent investigations of instruction in spelling.

NOFCIER, WILLIAM LINCOLN. "The Kentucky White House Conference on Child Health and Protection," *Bulletin of the Bureau of School Service* (Lexington, Kentucky: University of Kentucky, December, 1932), 215 pp.

Besides the papers by the several state officials this bulletin contains committee reports of the education committee, of the committee of social welfare, and of the committee on medical welfare of the Kentucky White House Conference on Child Health and Protection.

PARKER, H. T. *Defects of Speech in School Children*, Educational Research Series, No. 15 (Melbourne, Australia: Melbourne University Press, 1932), 96 pp.

After discussing certain theoretical considerations the author presents the sources of data employed in the present investigation, and discussions of the incidence of defect, stammering, lalling, baby talk, lisping, whispering, defects due to organic disabilities, other defects,

general consideration of causes, age distributions, sex differences, the relation of speech defects to mental subnormality, remedial measures reported, and general summary of results of investigation. There are suggestions as to methods and remedial measures for the teachers.

PHILLIPS, EVELYN B. *An Analysis of the Curricula of the Small High Schools of Maine*, University of Maine Studies, Second Series, No. 23 (Orono, Maine: University of Maine, 1932), 89 pp.

This bulletin contains a discussion of the types of curricula offered, subjects offered in the small schools, domination of college entrance requirements, years in which subjects are offered, alternations in the small high school, subjects required for graduation, subjects offered as electives, units offered and required in the small high schools, number of units required for graduation, and conclusion. Bibliography.

ROEMER, JOSEPH, AND OTHERS. "Abstracts of Unpublished Masters' Theses in the Field of Secondary-School Administration," *Bulletin of the Department of Secondary-School Principals of the National Education Association*, Bulletin No. 43 (December, 1932), 127 pp.

This bulletin contains abstracts of unpublished masters' theses in the field of secondary education completed in George Peabody College for Teachers.

STEELSMITH, D. C., AND OTHERS. *Proceedings of the Iowa White House Conference on Child Health and Protection*, (Des Moines, Iowa, April 14 and 15, 1932), 506 pp.

This bulletin is organized in four sections: I, medical service; II, public health service and administration; III, education and training; and IV, the handicapped. Each of these sections contains a number of papers summarizing the White House conference called by Governor Turner of the State of Iowa.

EDUCATIONAL ADMINISTRATION AND SUPERVISION

APPLEGARTH, L. W. "Science Heads," *School Science and Mathematics*, XXXII (December, 1932), pp. 944-947.

A questionnaire study of the duties, training, and salary of the heads of science departments based upon 180 replies from 414 cities.

CUFF, NOEL B., AND DONOVAN, H. L. "Intelligence Testing in Teachers Colleges," *School and Society*, XXXVI (December 24, 1932), pp. 830-832.

The authors present an analysis of the uses to which teachers colleges place intelligence tests. The two most frequently used intelligence tests are the Thurstone (American Council Test), and the Otis Self-Administering Test of Mental Ability.

DOWD, CONSTANCE E. "A Study of High-School Graduates with Reference to Level of Intelligence," *Journal of Educational Psychology*, XXIII (December, 1932), pp. 687-702.

From a study of 4,184 sixth-grade pupils, 913 of whom graduated from high school, the author concludes that high-school graduates are a selected group whose median percentile rank on the Otis Advanced Examination was 73.80 as contrasted with 45.87 the median percentile of the entire sixth-grade group.

EDWARDS, NEWTON. "The Law Governing the Dismissal of Teachers, I," *Ele-*

mentary School Journal, XXXIII (December, 1932), pp. 255-267.

A summary of legislation and court decisions, relating to the dismissal of teachers.

GOODFELLOW, LOUIS D. "A Study of the Interests and Personality Traits of Prospective Teachers," *Educational Administration and Supervision*, XVIII (December, 1932), pp. 649-658.

A statistical study of prospective teachers at Pennsylvania State Teachers College from which the author concludes that the personality differences of the high and low interest groups determined on the basis of the *Strong Vocational Interest Blank* are not statistically significant.

RELLER, THEODORE L. "How May the Content of a Course in School Administration for Teachers be Determined?" *Educational Administration and Supervision*, XVIII (December, 1932), pp. 677-686.

A questionnaire study of the kinds of information relating to school administration needed by teachers. Based upon the Commonwealth Teacher-Training Study.

SPAULDING, F. T., AND FREDERICK, O. I. "The Junior High School Movement in the Year 1930," *School Review*, XLI (January, 1933), pp. 15-26.

An advance presentation of certain data relative to the junior high-school movement from the National Survey of Secondary Education.

ZEIGEL, WILLIAM H., JR. "Research in Secondary Schools," *School Review*, XLI (January, 1933), pp. 27-39.

This is advance data from the National Survey of Secondary Education.

THE PSYCHOLOGY OF LEARNING AND TEACHING

KNOWLTON, DANIEL C., AND TILTON, WARREN J. "Auditorium versus Classroom Showing of Motion Pictures in History Teaching," *Journal of Educational Psychology*, XXIII (December, 1932), pp. 663-670.

An experimental study of the relative merits of auditorium and classroom showing of motion pictures in history teaching. The classroom showing was found to be superior.

ST. JOHN, CHARLES W. "The Maladjustment of Boys in Certain Elementary Grades," *Educational Administration and Supervision*, XVIII (December, 1932), pp. 659-672.

From a study of five hundred boys and four hundred-fifty girls enrolled in grades I to VI in a residential suburb of Boston the author finds that the educational achievement of the girls distinctly excelled the boys in every objective comparison. The author attributes this difference of the maladjustment of the boys to the conventional classroom and women teachers.

TINKER, MILES A. "Diagnostic and Remedial Reading, I," *Elementary School Journal*, XXXIII (December, 1932), pp. 293-306.

The first of a series of articles summarizing researches relating to diagnostic and remedial reading. Bibliography.

CURRICULUM CONSTRUCTION

COREY, STEPHEN M. "Text Book Overlapping in the Teachers College Curriculum," *Educational Administration and Supervision*, XIX (January, 1933), pp. 25-37.

After summarizing a number of previous investigations the author presents an analysis of the content of the basic text in thirty-nine courses in the Teachers College, University of Nebraska, in which he finds certain instances of extensive overlapping of content.

FITZGERALD, JAMES A. "Children's Spontaneous Writing," *Peabody Journal of Education*, X (November, 1932), pp. 172-178.

The author presents an analysis of the situation in which children write letters and the types of errors made in 3,184 social letters written by fourth-, fifth-, and sixth-grade children in life outside the school.

LUECK, WILLIAM R. "How Much Arithmetic and Algebra Do Students of First Year College Physics Really Know?" *School Science and Mathematics*, XXXII (December, 1932), pp. 998-1005.

In December, 1930, the Compass Survey Test in Arithmetic and the Douglass Diagnostic Test in Elementary Algebra were given to 280 students of first year college physics in five Iowa colleges. The author presents data on the percentage of incorrect responses for twenty arithmetical operations and twenty-five algebraic operations.

PRESSEY, L. C., AND PRESSEY, S. L. "The Determination of a Minimal Vocabulary in American History," *Educational Method*, XII (January, 1933), pp. 205-210.

The authors present a minimal vocabulary of 384 words in American history.

CHILD WELFARE, GUIDANCE, AND DEVELOPMENT

CARTER, HAROLD D. "Twin Similarities in Occupational Interests," *Journal of Educational Psychology*, XXIII (December, 1932), pp. 641-655.

From a study of the occupational interests of one hundred twenty pairs of twins the author finds that the interests of identical twins tend to be more similar than those of like-sex fraternal twins for both male and female pairs.

FISHER, MARY SHATTUCK. "Language Patters of Pre-school Children," *Journal of Experimental Education*, I (December, 1932), pp. 70-85.

From a study of pre-school children the author concludes that among normal and superior children chronological age is more important than mental age in determining the various stages in language development.

GRIGSBY, OLIVE JOHN. "An Experimental Study of the Development of Concepts of Relationship in Pre-school Children as Evidenced by Their Expressive Ability," *Journal of Experimental Education*, I (December, 1932), pp. 144-162.

From a study of the development in the verbalized concepts pertaining to relations of time, space, number, etc., of 83 children, two to six years enrolled in the pre-school laboratories of the Iowa Child Welfare Station, the author finds a gradual development of these concepts with mental age.

HAGMAN, ELMER R. "A Study of Fears of Children of Pre-School Age," *Journal of Experimental Education*, I (December, 1932), pp. 110-130.

The data of this investigation were obtained on 70 children enrolled in the preschool classes of the Iowa Child Welfare Station. The number of fears increased with age. There was a tendency for a

child to have fears corresponding to those of his mother.

JONES, HAROLD E., AND WILSON, PAUL T. "Reputation Differences in Like-sex Twins," *Journal of Experimental Education*, I (December, 1932), pp. 86-91.

From a study of the reputation differences of like-sexed twins in some eighteen personality traits the author concludes that these reputational differences contribute an environmental differentiating factor which is greater for fraternal than for identical twins.

UPDEGRAFF, RUTH. "Preferential Handedness in Young Children," *Journal of Experimental Education*, I (December, 1932), pp. 134-139.

The author finds that children as young as two years old show preference for the use of one hand or the other. The fact that such preferences are found at this age necessitates the study of still younger children for the causes.

WARING, ETHEL B. "A Guide for Studying the Personality of a Young Child," *Journal of Experimental Education*, I (December, 1932), pp. 96-109.

This investigation presents a method of studying the personality of young children. Contains concrete illustrative materials.

WELLMAN, BETH L. "The Effect of Preschool Attendance upon the I.Q.," *Journal of Experimental Education*, I (December, 1932), pp. 48-69.

This study is a part of a larger study of the growth of the intelligence of children from two to fourteen years of age. Marked increases in I.Q. were found on repeated tests. The greatest gains were associated with pre-school attendance.

MEASUREMENTS, STATISTICS AND METHODS OF EDUCATIONAL RESEARCH

CONRAD, HERBERT S. "The Validity of Personality Ratings of Preschool Children," *Journal of Educational Psychology*, XXIII (December, 1932), pp. 671-680.

From a statistical study of ratings made in the Institute of Child Welfare, University of California, the author concludes that valid and reliable personality ratings may be made of preschool children.

CUFF, NOEL B. "Scoring Objective Tests," *Journal of Educational Psychology*, XXIII (December, 1932), pp. 681-686.

The author reports the results of a study of the speed and accuracy of different methods of scoring objective tests, concluding that when the answers are indicated on an answer sheet so that they can be marked with a mimeograph, tests can be scored two to six times more rapidly than when ordinary means are employed.

GRAY, J. STANLEY. "Scientific Postulates for Educational Research," *Educational Administration and Supervision*, XIX (January, 1933), pp. 18-24.

Modeled after Dr. Weiss' postulates for a behavioristic psychology published in the *Psychological Review* (January, 1925), the author presents scientific postulates for educational research covering such matters as the nature of existence, of physical phenomena, of the organism, of organic behavior, of behavior modification, of language, of society, of progress, of education, and of educational research.

SIMS, V. M., AND KNOX, L. B. "The Reliability and Validity of Multiple-response Tests When Presented Orally," *Journal of Educational Psychology*, XXIII (December, 1932), pp. 656-662.

Four forms of the Thorndike Test of Word Knowledge were given as a three-response, four-response, and a five-response test. While multiple-response tests presented orally were slightly more difficult than the same test presented visually, tests may be presented orally without seriously reducing the reliability.

NEW TESTS

MALIN, J. E. *Malin Diagnostic Test in the Mechanics of High School Chemistry*, (Forms A and B), Bloomington, Illinois: Public School Publishing Company, 1932.

There are two forms of this test, Form A and B, with fifty-one exercises divided into two parts. Directions for scoring and giving the test.

ODELL, C. W. *Standard Achievement Test on Educational Measurement*, (Forms 1 and 2), Bloomington, Illinois: Public School Publishing Company, 1932.

There are four subtests to this test as follows: Multiple-answer statements on educational measurement in general, matching exercises on prominent workers in the measurement movement, true-false exercises on available supply of tests in various fields, and true-false exercises on educational measurement in general.

PINTNER, RUDOLF. *The Pintner Intelligence Test*, Grades IV to VIII, Forms A and B, New York City: Bureau of Publications, Teachers College, Columbia University, 1932.

This test contains eight subtests as follows: vocabulary, logical selection, arithmetic reasoning, best answer, number sequence, classification, opposites, and analogies. Teachers' manual.

SANGREN, PAUL V., AND WILSON, MARY C. *Instructional Tests in Reading*, Grades I to IV, Bloomington, Illinois: Public School Publishing Company, 1932.

These tests measure such aspects of reading ability as word recognition, phrase recognition, understanding sentences, following directions, noting details, selecting the central thought, organizing ideas, using judgment, attacking new words, anticipating meaning, and using study outlines. Teachers' manual.

TOMLINSON, T. P. *The "Northern" Test of Educability*, London: University of London Press, 1932.

There is one form of this test with six subtests with three levels of difficulty for each. Teachers' manual.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Editor Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

Program of the American Educational Research Association.—The various sections and conferences of this professional group from February 25 to March 1 at the Minneapolis meeting will deal with: problems of research in state departments of education, city school systems, and colleges and universities; the science of education; evaluation and improvement of research techniques; coördination of effort in research; improvement of the curriculum and instructional materials; application of scientific techniques to significant problems in administration and supervision, elementary education, secondary education, higher education, and tests and measurements. The chairman of the Association is W. S. Gray of the University of Chicago.

Annual Report of the Federal Office of Education.—The Office of Education, as the branch of the government service maintained by Congress as a national clearing house of educational information, is now operating on an appropriation pared 34 percent during the last fiscal year. It is pointed out that this is a serious matter in an office so meagerly staffed, where the discharge of one specialist means also elimination of service and research in a whole field of education. In the face of the small appropriation which the Federal government contributes to the advancement of education in the United States through the Office of Education have come increased demands for service, accentuated by economic conditions. Incoming mail during the year totaled approximately 250,000 pieces, an increase of 50 per cent over that of five years ago.

During the past year the problems investigated have been of three major types: (1) those arising out of the present economic situation as it affects education, (2) those which may be termed status or descriptive studies of new and promising movements in education or of conditions for which there are frequent and urgent requests for information, and (3) those periodic studies of various phases of education for which this office has long been considered authority. Replies to more than 250,000 letters, 114 publications, exhibits at conventions, articles for periodicals, and *School Life* were the avenues for dissemination of the information collected.

The annual report of the Commissioner of Education lists services performed during the year as follows:

1. Completed the National Survey of Secondary Education, the findings to be reported in twenty-eight monographs.

2. Studied new problems arising in public school administration.

3. Evaluated foreign-education credentials from 819 sources in seventy different political divisions (229 more than were evaluated in the previous year.)

4. Supplied parents, schools, parent-teacher associations, leaders of parents'

groups, and leaders in national, state, and local study and reading groups with facts to help them in understanding their children and in dealing with problems of child training.

5. Studied the relation of physique and physical condition to intelligence and scholarship.

6. Staff members gave professional assistance to many groups, including the Pennsylvania State Department of Public Instruction, General Federation of Women's Clubs–Education Committee, state departments of education, and the National Congress of Parents and Teachers.

7. Surveyed school buildings at the request of state and city educational authorities and studied school building problems common to all communities.

8. Organized a service to collect important facts on education of approximately 15,000,000 native peoples in outlying parts and continental United States, and for the dissemination of information collected.

9. Supplied advice regarding the merging of institutions of higher learning in North Carolina and South Carolina.

10. Coöperated with the U. S. Department of Agriculture in surveying educational opportunities offered by counties of the Southern Appalachian Mountain region, and also collected information on the education of Spanish-speaking children in Arizona, California, Colorado, New Mexico, and Texas.

11. Collected statistics required by law.

The program of major educational surveys was affected by government economy. The National Survey of School Finance, begun as a four-year study on July 1, 1931, was ended June 30, 1932, when Congress did not appropriate funds for its continuance. One important part of the survey was continued for a few months by a General Education Board grant through the American Council on Education. An appropriation reduction of $20,000 for the National Survey of the Education of Teachers will curtail the adequate printing and distribution of information collected.

Staff members of the Office, during the year, made a survey of public schools in Youngstown, Ohio, coöperated with states engaged in various steps of consolidation, assisted in the survey of higher education in Mississippi, and evaluated the program of the Georgetown, Delaware, demonstration school. The Office continued its series of homemaking education conferences, one of which was held in Amherst, Massachusetts, and another in Minneapolis, Minnesota. Needed research in the homemaking education field was stimulated. Regional supervisory conferences were sponsored.

The Office of Education Library each month served more than two hundred persons not on the regular staff and 150 by inter-library loan. The library has 150,000 volumes, one of the largest collections of education books in the country. Information vital to four million Negroes eligible for education was gathered, useful facts were given to schools providing educational facilities for children who deviate from the normal (a new specialist was provided in this field), and a survey was made of the use of tests in city schools throughout the United States.

Other activities included: a study of nursery schools, investigation of guidance and industrial education problems, preparation of the first of a series of curriculum-preparation guidebooks helpful to school superintendents and curriculum committees, inspection of Howard University, maintenance of a record of edu-

cational legislation, aid to land-grant colleges, collection of information on important aspects of commercial education and education by radio, and collection of sources for valuable visual education materials. Staff members made nearly three hundred addresses before national, state, regional, and local groups.

New Courses of Study.—Mimeographed bulletin No. 6, 1932, of the Society for Curriculum Study contains a selected bibliography of courses of study published during 1930-1932. The selection was made under the direction of H. B. Bruner of Columbia University.

Ohio State Bureau of Educational Research.—The Educational Research Bulletin for October 12, 1932, is devoted to the annual report of activities of the Bureau of Educational Research at Ohio State University. The director, W. W. Charters, discusses "Measures of Research" from the point of view of evaluating the effectiveness of research, especially in terms of the work of his own Bureau. The activities of the following divisions of the Bureau are summarized: reference, appointments, editorial, survey, curriculum, accomplishment tests, personnel, and radio.

The Bureau is studying virtually no new problems this year. There are enough problems under way to keep the staff employed during these times of restricted appropriations. In curriculum reorganization the Bureau is studying the radical reorganization of course offerings, in both undergraduate and graduate areas, of the College of Education at Ohio State and hopes to have this project crystallized during the current year. In tests and measurements, in addition to assisting some fourteen departments on the campus to prepare objective tests, the staff is caring for the objective examinations of the American Council on Education in the fields of chemistry, botany, zoology, and biology. Unusual opportunity for service is provided in the direction of a study of the Ohio Soldiers' and Sailors' Orphans' Home, a state institution where seven hundred children are under twenty-four hour control of the institution from the age of four to the age of eighteen.

Research Division, N. E. A.—Publications of the Research Division of the National Education Association which have appeared between September 1, 1932, and January 1, 1933, include the following studies:

1. "Crime Prevention through Education," *Research Bulletin*, X, No. 4, September, 1932. This study summarizes statistics, costs, and factors associated with crime, and concludes that the united efforts of home, school, government, and other social agencies are necessary to alleviate fundamental maladjustments.

2. "Facts on School Costs," *Research Bulletin*, X, No. 5, November, 1932. This publication supplies data on the cost of public education as compared with national income, tax collections, and other public and private expenditures.

The Research Division has coöperated in an editorial and consultative capacity with regard to current issues of the *Review of Educational Research* published by the American Educational Research Association, a department of the National Education Association.

1. "Tests of Intelligence and Aptitude" is the title of the October issue.

2. "School Buildings, Grounds, Equipment, Apparatus, and Supplies" is the subject of the December issue. This number contains an index to Volume II and a list of members of the American Educational Research Association.

The Educational Research Service, maintained in coöperation with the Department of Superintendence, has issued circulars since September 1, 1932, as follows:

1. "Questionnaire Studies Completed Bibliography No. 3, 1931-32," Circular No. 9, 1932. The list of sixty-one studies presented in this circular is based on questionnaires submitted to city and state superintendents of schools since September, 1927, the results of which have been published since September, 1931.

2. "Education Discussed in Lay Magazines, July 1-October 1, 1932," Circular No. 10, 1932. This summary of articles relating to education which has appeared in non-educational magazines covers the period from July 1 to October 1.

3. "Expenditures and Personnel for Public Elementary and Secondary Day Schools, State School Systems, 1930-31," Circular No. 11, 1932. This circular reports statistical data on enrollment, attendance, teachers, and expenditures for the public schools of forty-one states.

4. "Education Discussed in Lay Magazines, December 1, 1932," Circular No. 12, 1932. This summary of articles in non-educational magazines covers the period from October 1 to December 1, 1932.

Arkansas Studies.—The fiscal year, 1931-32, for the Arkansas Division of Research was devoted largely to a survey of the financial status of the school districts. The State Board of Education desired to find feasible methods of relieving the financial distress of the public schools and requested the Research Division to make a detailed study of the educational burden and the financial status of each district in the state. This study furnishes the basis for a legislative program to be presented to the 1933 Legislature.

An important piece of research entitled, "Financing a Comprehensive Program of Elementary Education," was completed and published in the *Peabody Journal of Education*, May, 1932. An analysis of the tangible aspects and characteristics of an acceptable elementary school system was made and the cost of a satisfactory minimum program determined on the basis of such factors. It is based upon the idea that the cost of the school system will depend upon what is to be included in it.

The Division now has under way the writing of a bulletin on the "Organization and Administration of the School District." As a result of eighty county school surveys made by the director of the Division during the past six years, certain principles and criteria for determining a satisfactory unit of school government have been set up. These procedures and principles will be presented in the bulletin mentioned, which was ready for publication about January 1, 1933.

Idaho Curriculum Work.—Idaho has devoted the past two years to a revision of the secondary school course of study. The State Department secured the loan of R. D. Russell, Professor of Secondary Education at the University of Idaho, for the two-year period. Teachers of the state were organized into working committees, numerous questionnaires were sent out, and studies made to determine requirements, objectives, aims, etc. These committees were brought together for summer session work at the University of Idaho where they worked out their plans and organized definite construction committees to carry on the project during the year. Many of the proposed plans and

methods were tested out in the schools of the state under the direction of committee members. The director, Dr. Russell, visited the committees frequently, checked over the work, made suggestions for further studies, and promoted the actual writing of the courses.

A second summer session at the university brought together curriculum experts from outside the state, as well as from within, and the writing and checking of the course continued. At the end of two years the state department is issuing eighteen bulletins covering the subjects in the junior and senior high school curriculum together with bulletins on guidance, administration, and extra-curricular activities. The state feels that it has a rather exceptional course of study in that it represents the combined effort of some six hundred teachers, the faculty of the state university, the faculties of the state normal schools, in fact, every major educational force of the state.

Kentucky Educational Commission.—For the purpose of rectifying some of the weaknesses of the school system and of laying the foundation for a more satisfactory school program, the 1932 General Assembly made plans for a Kentucky Educational Commission and provided that its duties should be "to direct a study of public education in Kentucky and to report its findings to the Governor and the General Assembly of this Commonwealth at the opening of its next regular session, with recommendations of such measures and such revision of our school code as may be found necessary for increasing the efficiency and equalizing the benefits of public education throughout the Commonwealth."

On April 9, 1932, Governor Laffoon appointed the following persons as members of this Commission:

James H. Richmond, Superintendent of Public Instruction and Chairman of the Commission in accordance with Section 3 of the Commission Act.

Mrs. James G. Sheehan, President of the Kentucky Congress for Parents and Teachers, Danville.

Frank L. McVey, President of the University of Kentucky, Lexington.

H. H. Cherry, President of Western Kentucky State Teachers College, Bowling Green.

J. W. Bradner, Superintendent of City Schools, Middlesboro.

H. W. Peters, County Superintendent of Christian County Schools, Hopkinsville.

W. J. Webb, Attorney, Mayfield.

Yancey Altsheler, Wholesale Grocer, Louisville.

Ben Williamson, Former United States Senator, Ashland.

Curriculum Work in Maine.—During the past year Maine has been using actively in all the elementary schools of the state the revision of the new elementary school curriculum which was completed in September, 1931. This revision was prepared by committees from the state representing superintendents of schools, state normal schools, and elementary teachers. The work was finally edited and brought up-to-date from an educational and pedagogical viewpoint by the Elementary Division of New York University headed by Robert K. Speer. The new curriculum is of great assistance to teachers and pupils.

During the past three years committees from the faculties of the state normal schools, under the direction of Ned H. Dearborn of New York University, have been working on a revision of the normal school curriculum. Their work was so far completed during the past summer that

typewritten copies were made of the reorganized curriculum to be placed in the hands of the teachers this year for further criticism and study. It is anticipated that the work will be finally completed by the end of the present school year. This project has integrated and unified the curriculum of the normal schools to a high degree and is considered of great constructive value. As in all work of this character probably the members of the committees themselves have benefited more than can be estimated. It has broadened their professional viewpoint and has brought together the normal schools on a more friendly and comparative basis than has ever been possible in the past.

Maryland Projects.—The Bureau of Measurements in the Maryland State Department of Education coöperated with the state supervisor of elementary schools by helping to edit a bulletin entitled "Goals in Social Studies for Primary Grades I-III with Suggestions for Their Achievement." The state supervisor of elementary schools led a group of supervisors and teachers of the Eastern Shore counties of Maryland in the construction of units in the social studies intended to become the core around which the work of the primary grades can be centered.

The state-wide testing program in the twenty-three counties carried on in October, 1931, with the Greene-Noar tests in English, the Wisconsin Inventory and the Clapp-Young tests in arithmetic reasoning, and the Clapp tests in English was not repeated in the spring of 1932 because of the need for retrenchment. About one-half of the counties gave another form of the test at their own expense. The counties were shown the inverse correlation between high test scores and low percentages of promotion, and vice versa. This led to a revaluation of promotion policies in a number of the counties.

Each county was asked to set up a supervisory program for one, two, or three years in advance, based on the needs of the county as revealed in the factual data available regarding pupils and teachers. Six of the best reports submitted are being circulated among the supervisors. The most valuable material from these reports was discussed at a fall supervisory conference led by the assistant state superintendent of schools. The supervisors feel that the work of the current school year started off more auspiciously because their annual report had looked ahead instead of merely reporting on conditions of the past.

In response to demands for reduction of local property taxation, the Governor's Tax Survey Commission asked the state department of education to present plans for a more equitable distribution of state aid throughout the state if additional revenue could be secured through indirect taxation. The plans suggested include the additional cost required if the state carries a percentage of the cost of the minimum school program in every unit in the state, and in addition provides state aid so that the remainder of the minimum program may be carried on a local tax rate lower than that now required if a county is eligible to share in the equalization fund.

New Mexico Studies.—The New Mexico educational forces are faced with two major problems: those co-existent with a wide system of rural schools and those presented by a large non-English-speaking population. Over fifty percent of the school children speak Spanish in their homes.

Two years ago the University of New Mexico in cooperation with the State Board of Education, Bernalillo County, Senator Bronson M. Cutting, and the General Education Board assumed control of a county school of some six hundred Spanish-speaking children. It was decided that two problems should receive experimental study. The first is relative to the intelligence of Spanish-speaking children and the following questions will indicate the type of work to be undertaken:

1. Is the low school level of the Spanish-speaking child in the elementary schools of New Mexico due to a low intelligence quotient or to poor teaching?

2. Can the intelligence quotient of these children be raised?

3. Do the Spanish-speaking children reach a point of maturity earlier than the English-speaking children?

4. Are there certain methods of instruction which are more efficacious than others in dealing with the Spanish-speaking child?

5. To what extent will methods of instruction devised for English-speaking children need to be modified to fit Spanish-speaking children?

In order to check the adequacy of the experimental work a careful and scientific program of testing is being carried out. Binet tests were given at the beginning of the five-year period of experimentation and will be repeated at the close. Group intelligence and group educational tests are given at the end of each year. In addition, numerous case studies are being made.

The second field of work is concerned with teacher training. It is recognized that there are many teachers in the state who lack specialized training for dealing with non-English children. In an endeavor to correct this shortcoming a series of scholarships has been devised which will give specialized training to a small group of teachers actually in service. During the year twenty-four teachers in service are brought to San José where they attend demonstrations and lectures and participate in the work of the school. This work is very similar to all teacher-training institutional work except that at San José they are working constantly with children of Spanish descent. In other words, they are receiving specialized training with non-English-speaking children. Part of the course is spent in a one-room school located in the adjacent mountains where conditions are typical and the visiting teacher may try, under supervision, the new instruction which she has received. Attached to the San José School is a field worker, paid by the state, who visits the teachers upon their return to their old schools. She guides them in the selection of materials and is a consultant on any problem pertaining to their work. It is too early to judge of the success of the San José experiment but it promises an answer to some of the perplexing problems involved.

Texas Investigations.—The Division of Research and Accounting in the Texas State Department of Education was organized July 1, 1930, through the assistance of an appropriation from the General Education Board. During the past biennium the efforts of this division have been directed mainly to the revision of accounting procedures of pupil and teacher personnel and school finances. This revision involves changes of procedure not only in the system of reporting to the state office, but also within each of the administrative school units in the state. There are more than one thousand independent school districts reporting directly to the state office, and ap-

proximately 6,500 common school districts, each of which makes a report to the office of the county superintendent having jurisdiction, where in turn these common school district reports are combined into 254 county reports submitted by county superintendents to the state office.

Revision of the forms used in personnel accounting permits a uniform procedure in recording and reporting enrollment, attendance, etc. It is true that most of the effort has been centered on that phase of pupil accounting generally referred to as the "quantitative" aspect. Incidentally, however, many school systems have realized and are recognizing the necessity for permanent cumulative child accounting records. Revision of the annual financial reports has been made in accordance with the generally accepted classifications of receipts and disbursements. The current year will provide reports for this office on these revised bases.

Through the latter part of 1932 the Division participated in collecting data and making such tabulations and computations as were required for a study of the state supported institutions of higher learning being carried on by the State Board of Education in accordance with provisions of the act creating this Board. Late in 1932 the findings and recommendations of the study were being considered both by the State Board of Education and by the state institutions of higher learning.

Data have been collected for a study of the teaching personnel of the public schools of the state. Special factors to be considered are certification, experience, tenure, training, and assignment of teachers.

Wyoming Investigations.—A study of per pupil cost in relation to enrollment, class-size, and number of teachers was based on 1930-31 data secured from thirty-two Wyoming high schools selected at random. Correlations were calculated between the four variables involved with results of: .89 between enrollment and number of teachers, .71 between median class-size and enrollment, and .58 between median class-size and the number of teachers. There was a negative correlation of —.45 between cost per pupil in A.D.A. and class-size. By the method of partial correlation, it was found that the only significant correlation was between class-size and the cost per pupil where r was —.622. Only one conclusion was drawn from the study, namely, that the cost per pupil in average daily attendance in Wyoming could be reduced most directly by increasing the size of the class.

A survey of reading in the rural elementary schools was made during the year. The McCall-Crabbs Standard Test Lessons in Reading were used in Grades III to VIII tri-weekly throughout the year. In January the following reading tests were given:

Grade I—Gates Word Recognition Test, Type I, Form II.

Grade II—Type III, Form II.

Grades III-VIII—Type D, Form II.

In the May testing, three types of Form I of the Gates Test were given in Grades I and II. Four types of Gates Tests were given in Grades III to V. The Thorndike Reading Scale, Form II, was used in Grades VI, VII, and VIII. The median scores in May showed that Grades I, II, III, and V were from .03 to .11 points above the median for the respective grades. Grades IV, VI, VII, and VIII were all below standard, the variation being from —.09 to —.59. The complete report contains twenty-five mimeographed pages.

New Method for Scoring the Strong Interest Test.—A new adaptation of the Hollerith tabulator promises to make financially feasible a much wider use of the Strong Interest Test in the professional and vocational guidance of college students and others in need of counselling. The new method reduces the cost of scoring the test to about one-half the present cost. This reduction is achieved by eliminating the hand-selection of the pre-punched cards which characterizes the current method of scoring the test.

The new method was devised by the staff of the Columbia University Statistical Bureau, in collaboration with the engineering and laboratory staffs of the International Business Machines Corporation. The method involves the use of a standard Hollerith tabulator with a simple attachment which can be made at nominal cost. For this reason, the new method will be of particular interest to the large and growing number of colleges that already have Hollerith installations.

By the coöperation of the International Business Machines Corporation the Psychological Corporation was enabled to exhibit the first tabulator equipment with the scoring device at the recent business show at the Grand Central Palace in New York City. The machine is now on permanent exhibition in the Columbia University Statistical Bureau. Information concerning the device may be secured from the Columbia University Statistical Bureau, the Psychological Corporation, or the International Business Machines Corporation.

Illegal Use of Copyrighted Material in Books.—A statement from the National Association of Book Publishers points out that in the past two years there has been a startling increase in the use of literary property without the permission of the author or the copyright owner. Professors and teachers lift pages, in some cases even chapters, from copyright books and duplicate them for distribution to students, without realizing that this practice is unethical and illegal and a definite handicap to the future production of scholarly work.

The federal copyright laws give to the author (or publisher if he is the copyright owner) "the exclusive right to print, reprint, publish, *copy*, and vend the copyrighted work." Copying without specific permission from the copyright proprietor is contrary to the law and the person who uses book material without authorization is liable for prosecution.

Often teachers who duplicate material for distribution to students are thoughtless or ignorant of the rights involved, but in so doing they are violating the law and doing grave wrong to authors and publishers. Copyright control is granted authors not for the sole purpose of selfish aggrandizement, but to encourage research, authorship, and publishing initiative and investment.

Since so many members of the teaching profession are authors themselves, they should understand that the practice of copying books, if applied to their own books, would necessarily cut down their royalties and would also be unfair to the publishers who have thousands of dollars invested in producing the books. New books could not be brought out if they were not accorded copyright protection, and all civilized countries recognize this fact and safeguard literary property.